HANSEATIC CTV-2195VT

MODEL

SERVICE MANUAL

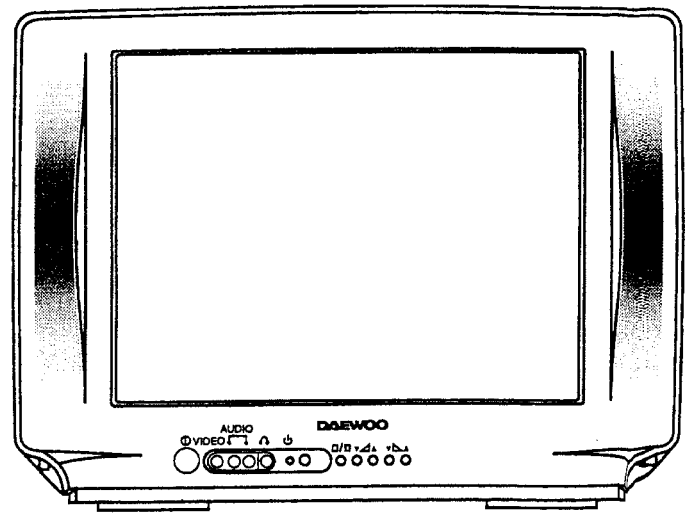
DAEWOO

Service Manual

51 / 55 Cm **Stereo Colour Television**

CHASSIS : CP-380L

MODEL : 21T1LST/20T1LST/
21T2LST/20T2LST



DAEWOO ELECTRONICS CO., LTD.

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■ Specifications

CRT	20" : A48JLL90X02(OEC) 21" : A51JSW90X02 (OEC), A51EAL55X01(PHILIPS), A51EBV13X09(POLKOLOR)
System	LF : PAL - B/G for West Europe, NTSC-3.58/4.43(play back) LA : PAL - B/G, SECAM-L/L' for France, NTSC-3.58/4.43(play back) LU : PAL- I for U.K, NTSC-3.58/4.43(play back)
Main Voltage	230V AC, 50Hz
Power Consumption	Stand-by mode : 2.0 Watts Normal operating mode : 20",21" = 49 Watts
stereo system	2-Carrier & NICAM Stereo
Sound output	2.5+2.5 Watts Approx.(at 1KHz, 60% MOD)
Speaker	3W 8 ohm x 2 EA
Antenna Impedance	75 ohm unbalanced input
Tuning system	VS(voltage synthesis) tuning
Tuner	3303KHC (LF, LA Model) BAND I : CH2 - CH4 BAND III : CH5 - CH12 CABLE BAND : S1' - S3' , S1 - S20 HYPER BAND : S21 - S41 BAND IV, V : CH21 - CH69 DT2-IV17D (LU Model) BAND IV, V : CH21 - CH69
Number of program	70 programs
AUX. Terminal	21 pin EURO-SCART jack (AV input, TV output, RGB input) 21 pin EURO-SCART jack (AV input, S-VHS input) RCA type AV input jack Headphone jack (3.5 mm ϕ)
Remote controller	R-28B03 or R-35D05 with 2 "AA" type batteries
Teletext	8 page memory TOP & FLOF - West option :English, German/Dutch/Flemish, French, Italian, Spanish/Portuguese, Swedish/Finnish/Danish, Czech/Slovak - East option : Polish, Czech/Slovak, Rumanian, Hungarian, Servo-croat, German/Dutch/Flemish, French, Italian - Turkish option : Turkish, English, German/Dutch/Flemish, French, Italian, Spanish/Portuguese, Swedish/Finnish/Danish
OSD language	East, West, Turkish Version : English, French, German, Italian, Spanish

■ Safety Instruction

WARNING: Only competent service personnel may carry out work involving the testing or repair of this equipment.

■ X-RAY RADIATION PRECAUTION

1. Excessive high voltage can produce potentially hazardous X-RAY RADIATION. To avoid such hazards, the high voltage must not exceed the specified limit. The nominal value of the high voltage of this receiver is 24-26㎸(20", 21") at max beam current. The high voltage must not, under any circumstances, exceed 27.5㎸ (20"), 29.0㎸ (21").
   Each time a receiver requires servicing, the high voltage should be checked. It is important to use an accurate and reliable high voltage meter.
2. The only source of X-RAY Radiation in this TV receiver is the picture tube. For continued X-RAY RADIATION protection, the replacement tube must be exactly the same type tube as specified in the parts list.

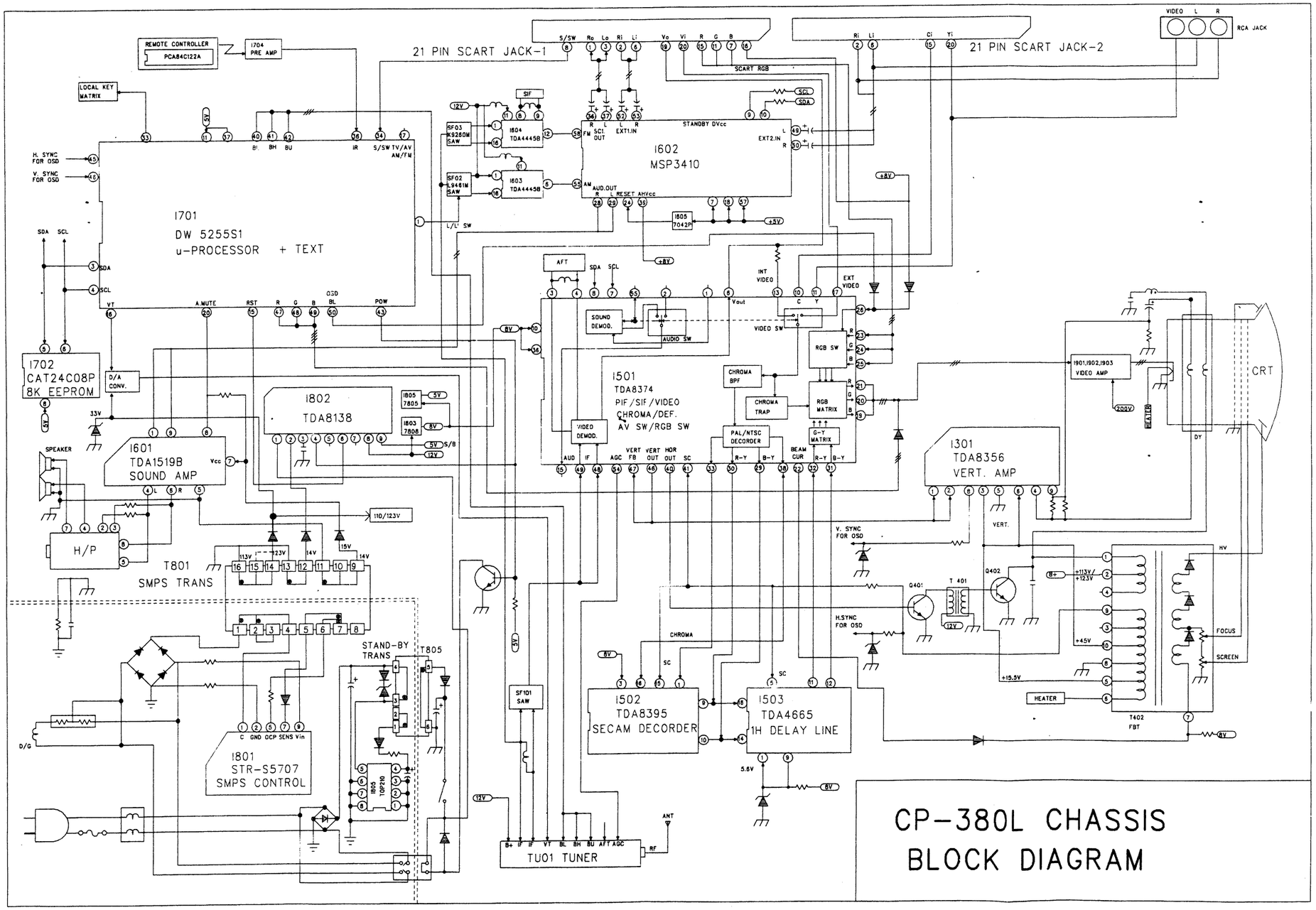
■ SAFETY PRECAUTION

1. Potentials of high voltage are present when this receiver is operating. Operation of the receiver outside the cabinet or with the back board removed involves a shock hazard from the receiver.
   1) Servicing should not be attempted by anyone who is not thoroughly familiar with the precautions necessary when working on high-voltage equipment.
   2) Discharge the high potential of the picture tube before handling the tube. The picture tube is highly evacuated and if broken, glass fragments will be violently expelled.
2. If any Fuse in this TV receiver is blown, replace it with the FUSE specified in the Replacement Parts List.
3. When replacing a high wattage resistor(oxide metal film resistor)in circuit board, keep the resistor 10mm away from circuit board.
4. Keep wires away from high voltage or high temperature components.
5. This receiver must operate under AC230 volts, 50Hz. NEVER connect to DC supply or any other power or frequency.

■ PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in this have special safety-related characteristics. These characteristics are often passed unnoticed by a visual inspection and the X-RAY RADIATION protection afforded by them cannot necessarily be obtained by using replacement components rated for higher voltage,wattage,etc. Replacement parts which have these special safety characteristics are identified in this manual and its supplements, electrical components having such features are identified by designated symbol on the parts list. Before replacing any of these components,read the parts list in this manual carefully. The use of substitute replacement parts which do not have the same safety characteristics as specified in the parts list may create X-RAY Radiation.

BLOCK DIAGRAM



■ Alignment Instructions

1. AFT

1.1 Standard B/G,D/K,I and L

1) Set a Signal Generator with
   - RF FREQUENCY = 38.9 MHz,
   - RF OUTPUT LEVEL = 80 ±5 dBuV
   - System = PAL / SECAM - B/G, D/K, I
2) Connect the Signal Generator RF Output to P101 (Tuner IF Output).
   There must be no signal input to the tuner.
3) Press the "AFT" KEY and wait until the TV screen display "AFT OK".

1.2 Standard SECAM-L' (France VHF-Low)

* Above mentioned "1.1" adjustment has to be done in advance.

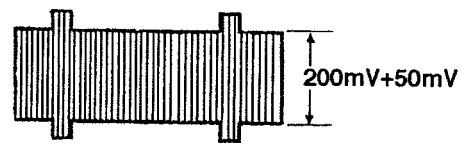
1) Set a Signal Generator with
   - RF FREQUENCY = 34.5 MHz,
   - RF OUTPUT LEVEL = 80 ±5 dBuV
   - System = SECAM - L'
2) Connect the Signal Generator RF Output to P101 (Tuner IF Output).
   There must be no signal input to the tuner.
3) Press the "L' AFT" KEY and wait until the TV screen display "L AFT OK".

2. AGC

1) Set a Pattern Generator with RF LEVEL 63 ±2 dBuV .
2) Connect a OSCILLOSCOPE PROBE to P101 (Tuner AGC Input).
3) Adjust AGC UP/DOWN KEY the voltage drop 1V dc over below its maximum voltage.

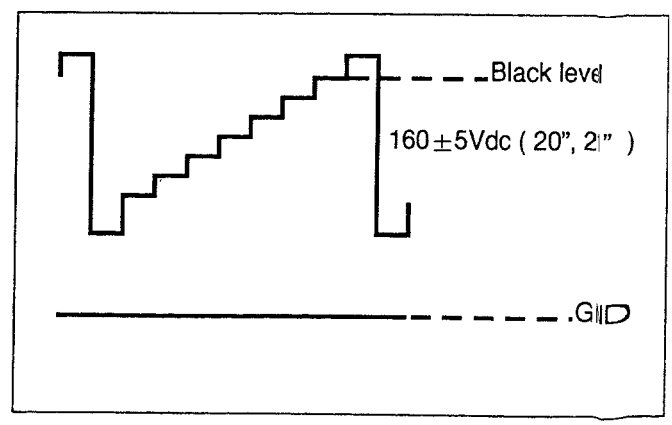
* Alternative Method

1) Set a Pattern Generator with
   - RF LEVEL 80 ±5 dBuV
   - PAL CROSSHATCH
   (without SOUND CARRIER)
2) Connect a OSCILLOSCOPE
   (Bandwidth ≥ 100MHz) PROBE
   to P101 (TUNER IF OUTPUT).
3) Use AGC UP/DOWN KEY to obtain
   an envelop amplitude 200 + 50 mVp-p.



3. SCREEN

1) Apply a COLOR BAR pattern signal.
2) Set the CONTRAST, BRIGHTNESS
   to MAX, COLOR to MIN.
3) Set the R,G,B LEVEL to CENTER (31/63)
   with R,G,B UP/DOWN KEY.
4) Connect a OSCILLOSCOPE PROBE
   to P903 (CRT CATHOD R, G, B).
5) Adjust the SCREEN VOLUME on FBT
   such that the highest black level voltage
   160 ±5Vdc (20", 21").



4. WHITE BALANCE

1) Set the TV to NOR I mode.
2) Set the R,G,B LEVEL to CENTER with R,G,B UP/DOWN KEY .
3) Adjust the R,G,B UP/DOWN KEY of the other color which did not appear on the screen to obtain WHITE.

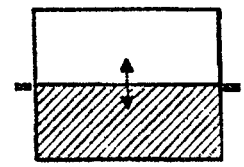
5. FOCUS

1) Apply a RETMA PATTERN signal.
2) Adjust the FOCUS VOLUME on FBT to obtain optimal resolution.

6. GEOMETRY

6.1 VERTICAL CENTER

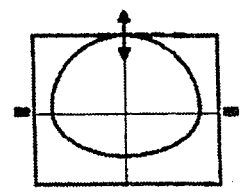
1) Set the TV to NOR I mode.
2) Pressing the V-CENTER UP/DOWN KEY, the lower half of the screen is blanked.
3) Adjust the border line of blanked picture coincident with the mechanical center marks of the CRT using the V-CENTER UP/DOWN KEY.



6.2 VERTICAL SIZE

* The VERTICAL CENTER adjustment has to be done in advance.

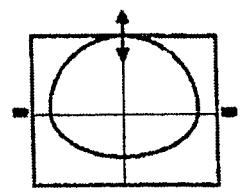
1) Apply a RETMA PATTERN signal.
2) Set the TV to NOR I mode.
3) Adjust the upper part of the picture with the V-SIZE UP/DOWN keys.



6.3 VERTICAL SLOPE

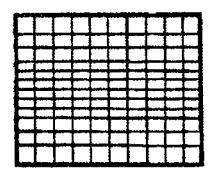
* The VERTICAL SIZE adjustment has to be done in advance.

1) Apply a RETMA PATTERN signal.
2) Adjust the lower part of the picture with the V-SLOPE UP/DOWN keys.



6.4 VERTICAL S-CORRECTION

1) Apply a CROSSHATCH PATTERN signal.
2) Adjust the S-COR UP/DOWN KEY to obtain the same distance between horizontal lines.



6.5 HORIZONTAL CENTER

1) Apply a RETMA PATTERN signal.
2) Adjust picture centering with CENTER LEFT/RIGHT keys.

■ SIF Adjustment

1. Apparatus connection & Presetting

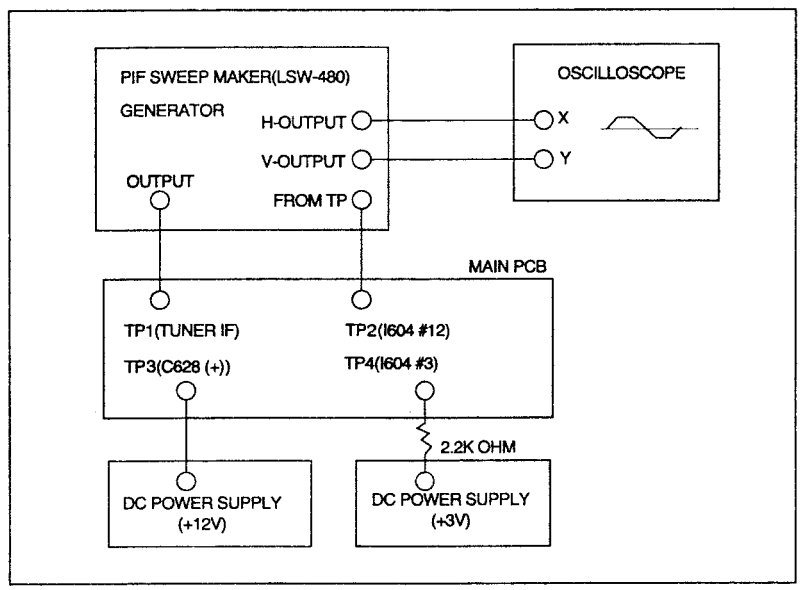
***CONNECTION**

1) Connect H-out of LSW-480 to X-axis of the oscilloscope and V-out of LSW-480 to Y-axis of the oscilloscope
2) Connect the sweep signal output to TP1.
3) Set ATTENUATOR of LSW-480 to 20dB.
4) Supply 12V D.C. voltage(B+) to TP3.
5) Supply 3V D.C. voltage to TP4.
6) Connect the test point of LSW-480 to TP2.
7) Adjust L607(AFT COIL) so that the P marker point is located on the reference level.

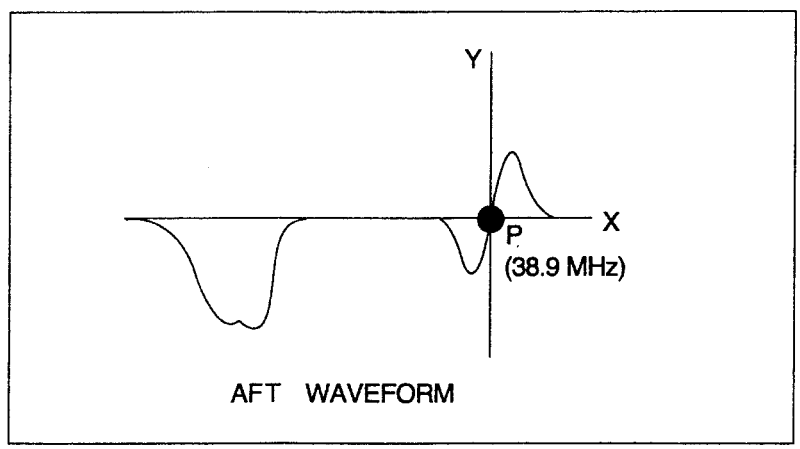
***PRESET**

1) Oscilloscope Scaling
   a) Put the scale of X and Y of the oscilloscope to D.C. level
   b) Set the horizontal time display to X-Y
   c) Put the horizontal axis(X) to 1V/div and the vertical axis(Y) to 2V/div.
2) LSW-480 MARKER FREQ SETTING

fp(n+1)	fs	fc	fp-2	fp	fs(n-1)
31.9	33.4	34.47	36.9	38.9	40.4



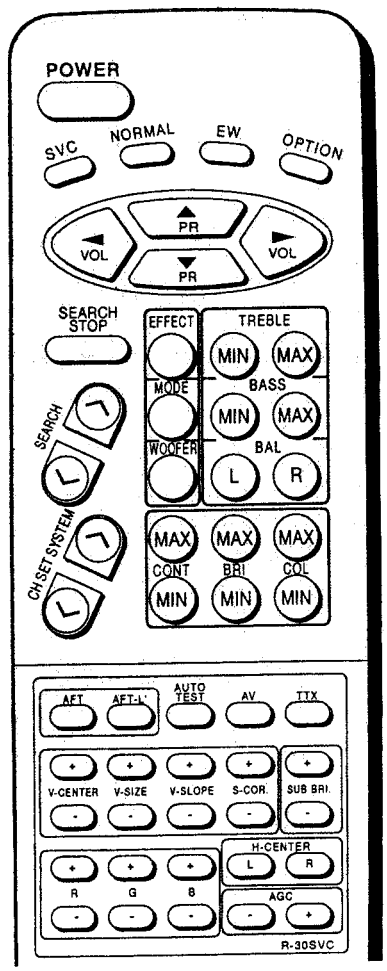
- Connection For SIF Adjustment -



If EEPROM (I702) has been changed ;
- Option data has to be changed and
- all alignment function has to be readjusted .

* The initial state of adjustment are as follows;
- R,G,B = (32/63)
- AGC = (12/63)
- V-Center = 34/63(21"), 24/63(20")
- V-Size = 31/63(21"), 54/63(20")
- V-Slope = 44/63(21"), 29/63(20")
- S-Correction = 15/63(21"), 5/63(20")
- H-Center = 36/63(21"), 32/63(20")

*Service Remocon



■ IC Description

DW5255S*(Micro-controller & West/East Teletext Decoder)

(1) General Description

The TDA5255 contains a slicer for VPS and TTX, an accelerating acquisition hardware module, a display generator for "LEVEL 1" TTX data and a 8 bit u-controller running at 333 nsec cycle time.
The controller with dedicated hardware guarantees flexibility, does most of the internal processing of TTX acquisition , transfers data to/from the external memory interface and receives/transmits data via I^2C and UART user interfaces.
The Slicer combined with dedicated hardware stores TTX data in a VBI 1Kbyte buffer.
The u-controller firmware does the total acquisition task (hamming- and parity -checks, page search and evaluation of header control bits) once per field.

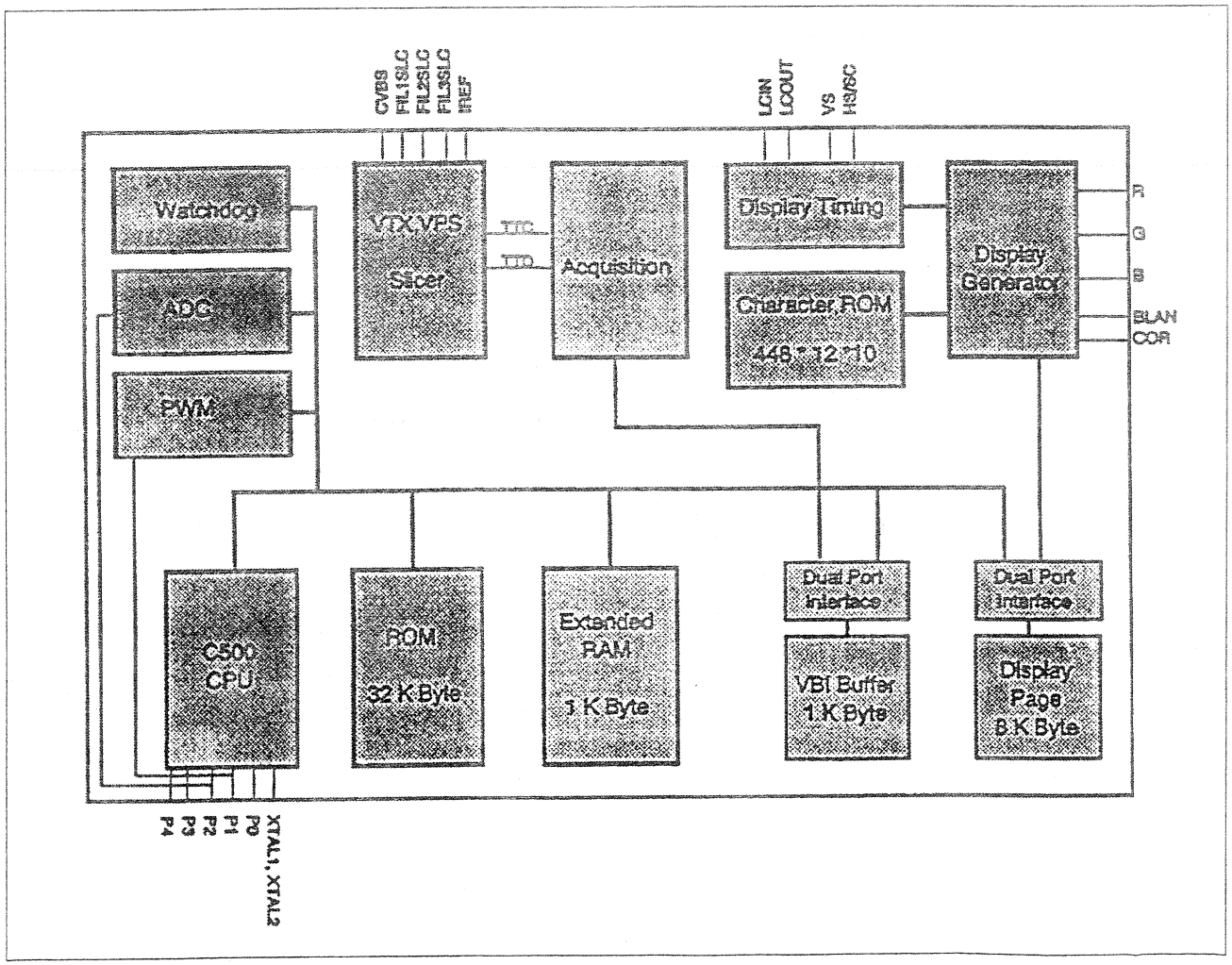
(2) Feature

- **Acquisition:**
  - feature selection via special function register
  - simultaneous reception of TTX and VPS
  - fixed framing code for VPS and TTX
  - programmable framing code window for TTX
  - Acquisition during VBI
  - direct access to VBI RAM buffer
  - Acquisition of packets x/26, x/27, 8/30 (firmware)
  - assistance of all relevant checks (firmware)
  - 1-bit framing-code error tolerance (switchable)
- **Display:**
  - features selectable via special function register
  - 50/60 Hz display
  - level 1 serial attribute display pages
  - blanking and contrast reduction output
  - 8 direct addressable display pages
  - 12 x 10 character matrix
  - 96 character ROM (standard 90 character set)
  - 143 national option characters for 11 languages
  - 288 characters for X/26 display
  - 64 block mosaic graphic characters
  - 32 free addressable characters for OSD in expanded character ROM + 32 inside OSD box
  - double height (TOP/BOTTOM)
  - conceal/reveal
  - transparent foreground/background -inside/outside of a box
  - cursor (colour changes from foreground to background colour)
  - flash (flash rate 1s)
  - programmable horizontal and vertical sync delay
  - hardware assisted fast display page erase
  - full screen background colour in outer screen
- **Synchronization:**

  display synchronization to sandcastle or Horizontal Sync (HS) and Vertical Sync (VS) with startstop-oscillator or display synchronization to sandcastle or Horizontal Sync and Vertical Sync with external clock independent clock systems for acquisition, display and controller.

- **Controller:**
  - 8 bit configuration
  - 18 MHz internal clock
  - 0.33 µs instruction cycle
  - eight 16-bit data pointer registers (DPTR)
  - two 16-bit timers
  - watchdog timer
  - serial interface (UART)
  - 256 bytes on-chip RAM
  - 1 Kbyte on-chip extended RAM (access via MOVX)
  - 8 Kbyte on-chip ACQ-buffer-RAM (access via MOVX)
  - 6 channel 8-bit pulse width modulation unit
  - 2 channel 14-bit pulse width modulation unit
  - 4 multiplexed ADC inputs with 8-bit resolution
  - one 8-bit I/O port with open drain output and optional I²C emulation
  - two 8-bit multifunctional I/O ports
  - one 4-bit port working as digital or analog inputs
  - one 2-bit I/O port with optional address latch enable function
- **P-SDIP 52 package**
- **5 V supply voltage**

(3) Block Diagram



(4) Pin Description

Pin	Name	Symbol	Description
1	P3.1	SYS	SECAM-L' OUT for switching SAW filter L9461 - SECAM-L' : H - SECAM-L : L
2	P0.7/Open Drain	BUSSTOP	I²C BUS STOP IN for Computer controlled alignment in Factory (Active Low)
3	P0.6/Open Drain	SDA	Serial data IN/OUT for I²C
4	P0.5/Open Drain	SCL	Serial clock IN/OUT for I²C
5	P0.4/Open Drain	OPTION	#5 #6 Teletext H H West Teletext L H East Teletext H L Turkish Teletext
6	P0.3/Open Drain	OPTION	
7	P0.2/Open Drain	OPTION	#7 #8 #17 Tuning / Sound System L H H B/G(2-C, NICAM) H H H B/G, D/K(2-C, NICAM) L L H I/I(NICAM) H L H I(UHF only, NICAM) H H L L/L' B/G(2-C, NICAM) L H L B/G, L/L'(2-C, NICAM)
8	P0.1/Open Drain	OPTION	
9	P0.0/Open Drain	LED	LED drive OUT - Stand-by mode : H - Operating mode : L (IR reception : pulse)
10	VSS	VSS	Ground
11	VCC	VCC	Power Supply
12	XTAL1	OSCIN	Input to inverting osc. Amplifier
13	XTAL2	OSCOUT	Output of inverting osc. Amplifier
14	P4.0/ALE		Not Used
15	RESET	RST	RESET IN (ACTIVE LOW)
16	P1.7/14BIT PWM	VT	TUNING VOLTAGE OUT
17	P1.6/14BIT PWM	OPTION	TUNING SYSTEM
18	P1.5/14BIT PWM	F/SW	F/SW IDENT IN for stopping OSD display in RGB mode - H : TV /AV mode - L : RGB mode
19	P1.4/14BIT PWM	OPTION	ATS OPTION H:ON L:OFF
20	P1.3/14BIT PWM	MUTE	AUDIO MUTE OUT
21	P1.2/14BIT PWM	GND	GND
22	P1.1/14BIT PWM		Not Used
23	P1.0/14BIT PWM		Not Used
24	VSSA	VSSA	Analog GND for Slicer
25	FIL3	FIL3	PLL Loop Filter I/O for Phase Shifting

Pin	Name	Symbol	Description
26	FIL2	FIL2	PLL Loop Filter I/O for TTX Slicing
27	FIL1	FIL1	PLL Loop Filter I/O for VPS Slicing
28	VCCA	VCCA	Analog Supply for Slicer
29	IREF	IREF	Reference Current for Slicer PLLs
30	CVBS	CVBS	CVBS IN
31	P2.3/8 bit ADC		Not Used
32	P2.2/8 bit ADC	AGC	IF AGC INPUT for Auto Tuning System
33	P2.1/8 bit ADC	KS	Local KEY SCAN IN
34	P2.0/8 bit ADC	S/SW	S/SW IDENT IN for Automatic switching between TV/AV mode - H : AV / RGB mode - L : TV mode
35	VSS	VSS	Ground
36	P3.3/INT1	IR	REMOTE IR IN
37	VDD	VDD	Power Supply
38	LCIN	LCIN	CLOCK IN for OSD
39	LCOUT	LCOUT	CLOCK OUT for OSD
40	P3.7/TXT/I/O	BL	BAND VHF-L OUT (Active High)
41	P3.7/RXD	BH	BAND VHF-H OUT (Active High)
42	P3.4T1	BU	BAND UHF OUT (Active High)
43	P3.4/T0	POWER	POWER CONTROL OUT
44	P3.2/INT0		Not Used
45	HS/SC	HSYNC	HOR. SYNC. IN (Active High)
46	P4.7/VS	VSYNC	VERT. SYNC. IN (Active High)
47	R	R	RED OUT
48	G	G	GREEN OUT
49	B	B	BLUE OUT
50	BLANK	BL	BLANK OUT
51	COR	COR	Not Used (CONTRAST REDUCTION OUT)
52	P3.0	EVEN/ODD	EVEN/ODD OUT for non-interlacing in TTX mode

CAT24C08P (E^2 PROM)

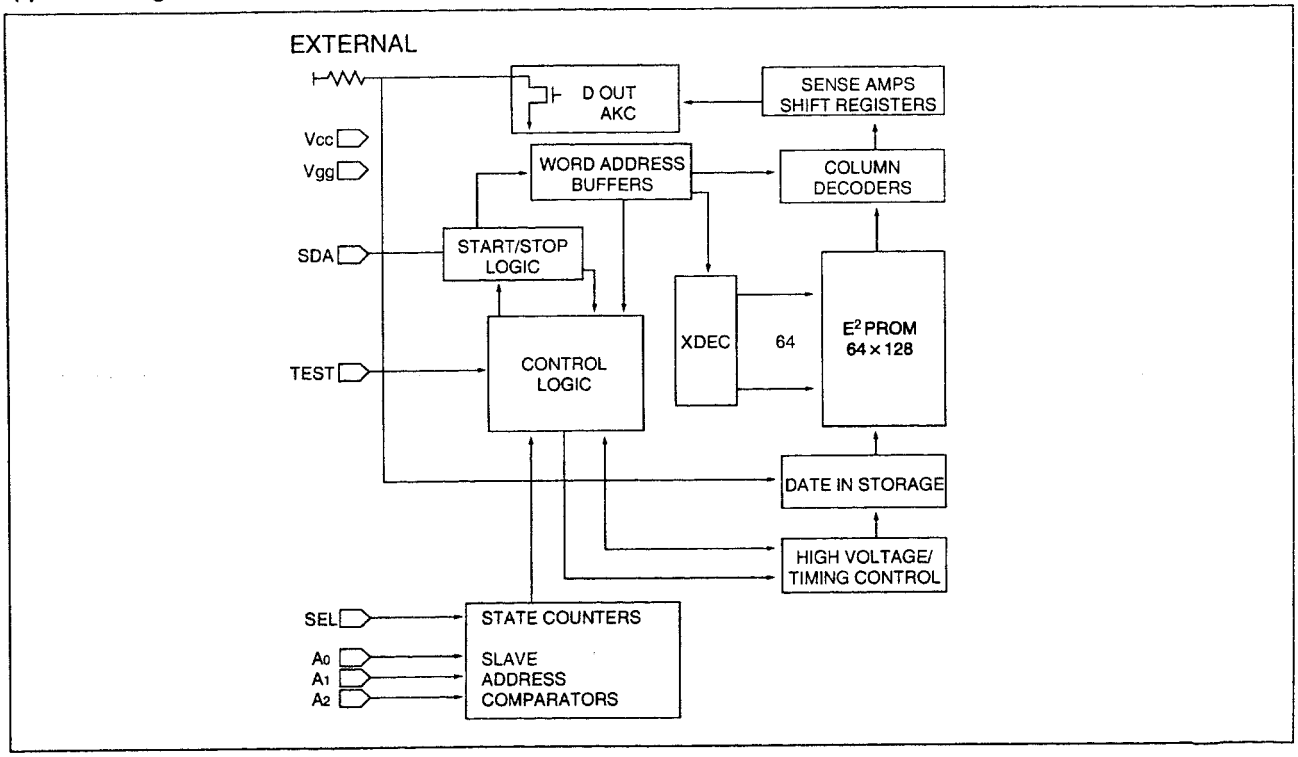
(1) Typical Features

- IC Bus compatible
- Low power CMOS Technology
- 16 Byte page write Buffer
- Self-Timed Write cycle with Auto-Clear
- 100,000 program/Erase cycles
- 100 Year Data Retention
- Optional High Endurance Device Available

(2) Description

The CAT24C08P is a 8K bit serial CMOS E^2 PROM internally organized as 1024x8bits.
The CAT24C08P features a 16 byte page write buffer.

(3) Block Diagram



(4) Pin Description

PIN	SYMBOL	DESCRIPTION
1-3	A0, A1, A2	Device Address Inputs
4	Vss	Ground
5	SDA	Serial Data/Address
6	SCL	Serial Clock
7	TEST	Connect to Vss
8	Vcc	+5V Power supply

TDA8374A (Single chip TV Processor for Negative modulation IF)
TDA8374 (Single chip TV Processor for Negative & positive modulation IF)

(1) General Description

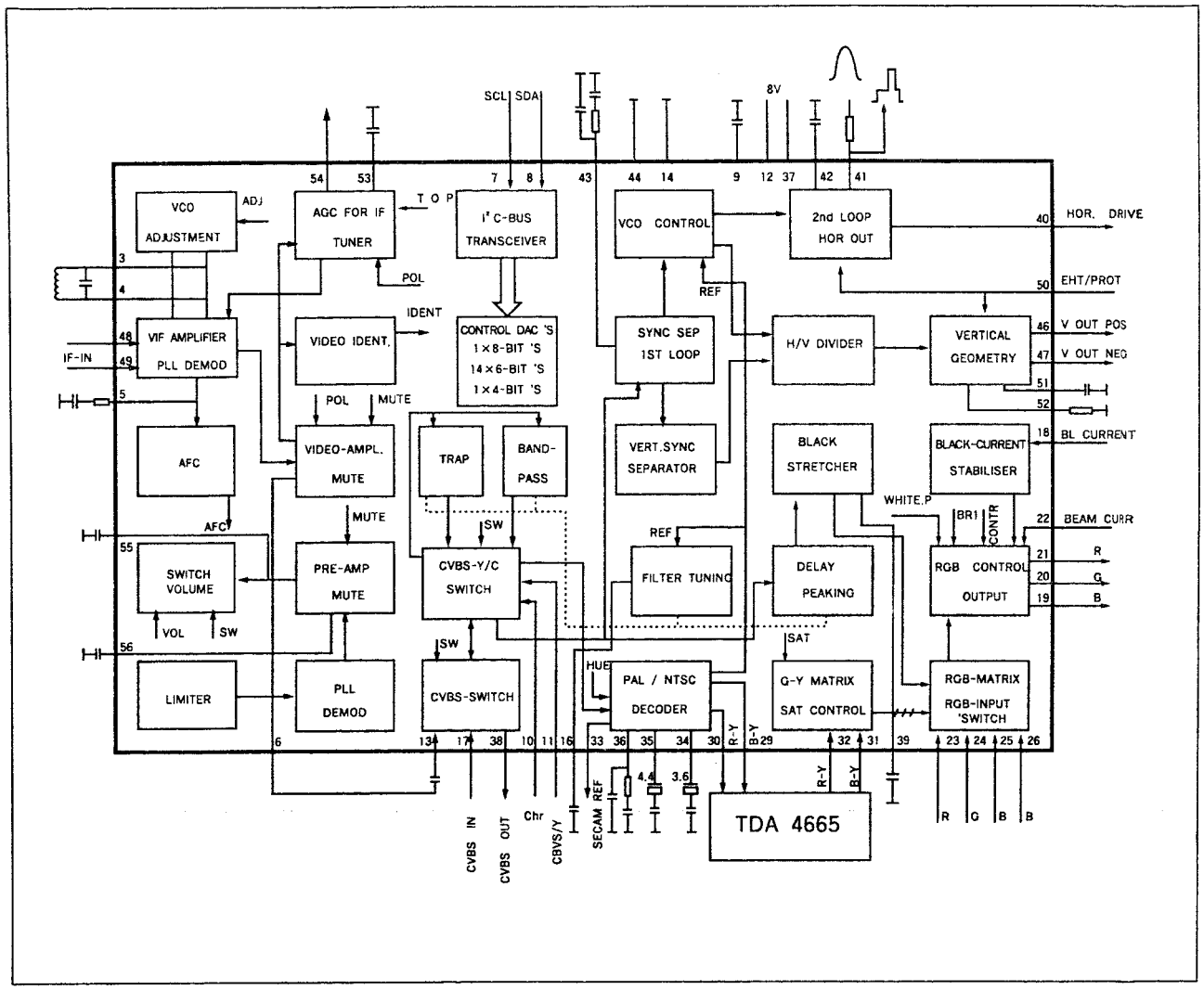
The TDA8374(A) is I²C-bus controlled single chip TV processors which are intended to be applied in PAL/NTSC television receiver.

The IC is mounted in a S-DIL 56 envelope.

(2) Feature

- **IF**
  - Vision IF amplifier with high sensitivity and good figures for differential phase and gain
  - PLL demodulator with high linearity offering the possibility for (single standard) intercarrier stereo audio application .
  - Alignment PLL via I²C
  - [TDA8374] Multistandard IF with negative and positive modulation, switchable via I²C
- **Video**
  - Integrated luminance delay line
  - Integrated chroma trap and bandpass filters (auto calibrated)
  - Asymmetrical peaking circuit in the luminance channel
  - Black stretching of non standard CVBS or luminance signals
- **Colour**
  - SECAM interface for application with SECAM add-on TDA8395.
- **RGB**
  - RGB control (brightness, contrast, saturation)
  - Black current stabilization and white point adjustment
- **Input / Output**
  - Flexible video source select with CVBS input for the internal signal and two external video inputs(one switchable for CVBS or Y/C).
  - The output signal of the video source select is externally available (also as CVBS when Y/C input is used).
  - External audio input.
  - Linear RGB input with fast blanking.
- **Synchronization and Deflection**
  - Horizontal synchronization with two control loops and alignment free horizontal oscillator.
  - Slow start and slow stop of the horizontal drive output to enable low stress start-up and switch-off from the line circuit at nominal line supply voltage.
  - Vertical count-down circuit for stable behavior with provisions for non-standard signals.
  - Vertical geometry control.
  - Vertical drive optimized for DC coupled vertical output stages.
- **Control**
  - Full I²C bus control, as well for customer controls as for factory alignment.
  - All automatic controls have an option for forced mode.
- **Power consumption**
  - Low power consumption (900 mW at 8.0 Volts).
- **Packaging**
  - SDIL-56 (Shrinked Dual In Line, 56 pins).

(3) Block Diagram



(4) Pin Description

No	Name	Description
1	SOUND IF INPUT	Not Used.
2	EXT AUDIO INPUT	Not Used.
3 4	VCO REF FILTER	The IF VCO tuned circuit is applied to these pin. Its resonance frequency must be two times the IF-frequency and in between a range of 64-120MHz. This range is suitable for the IF standards as 33.4, 38.9, 45.75 and 58.75MHz. The VCO frequency can be adjusted by I^2C bus so a fixed coil can be used.
5	PLL LOOP FILTER	The PLL loopfilter is a first order filter with R=390 ohm and C = 100nF in series to ground. The loopfilter bandwidth is 60kHz and is optimal for both fast catching and sufficient video suppression for optimal sound performance. Sound performance can theoretically be improved by adding a small capacitor (approx.0- 4.7nF) between pin 5 and ground. This however must be evaluated further because the normal video signal response should not be effected.
6	IF VIDEO OUTPUT	Although the video output impedance is low it is recommended to avoid high frequency current in the output due to for instance sound trap filters. This can be achieved by means of an emitter follower at the video output with a 1 KΩ resistor in series with the base.
7	BUS INPUT : SCL	Serial clock line
8	BUS INPUT : SDA	Serial data line
9	BANDGAP DECOUPLING	The bandgap circuit provides a very stable and temperature independent reference voltage. This reference voltage (6.7V) ensures optimal performance of the TDA8374 and is used in almost all functional circuit blocks.
10	CHROMA INPUT	The supplied C S-VHS input burst amplitude should be nominally 300mV_{pp} (assumed is a colour bar signal with 75% saturation and with chroma/burst ratio of 2.2/1). The C S-VHS input is internally clamped to 4V via 50 KΩ. The external AC coupling capacitor with 50 KΩ forms a high pass filter. A recommended coupling capacitor is 1 nF; the high pass filter cut off frequency is then approximately 3KHz.
11	Y/CVBS INPUT	The Y S-VHS signal of 1V_{pp} (inclusive sync amplitude) is AC coupled to pin11.
12 37	MAIN POSITIVE SUPPLY	The TDA8374 has a main supply pin 12 and a horizontal supply pin 37. Both pins have to be supplied simultaneously. Notice that the IC has not been designed to use this pin 37 as start pin. (pin 37 supplies the horizontal oscillator, PHI-1 and PHI-2) (pin 12 supplies the rest of the circuits in the IC) The nominal supply voltage is 8V. With min/max values of 7.2-8.8V. Also in stand-by condition the IC must be supplied with 8V.

No	Name	Description
		A voltage detection circuit is connected to both pins. - pin12 if V12 <6.8V than a power on reset, POR. is generated. The Hout output is disabled immediate. - pin37 if V37 <5.8V than the horizontal output is disabled immediate.
13 17	INT CVBS INPUT EXT CVBS INPUT	It is recommended that the CVBS1 int and CVBS2 ext input amplitudes are 1 V_{pp} (inclusive sync amplitude). This, because the noise detector switches the Ø1 loop to slow mode (i.e. auto Ø1mode when FOA, FOB = 0,0) when noise level exceeds 100mV_{rms} (i.e. at S/N of 20dB).
14	GROUND	All internal circuits are connected to this ground pin 14.
15	AUDIO OUTPUT	Not Used
16	DECOUPLING FILTER TUNING	Voltage variations at pin 16, which can be due to external leakage current or crosstalk from interference sources, should be less than 50mV to ensure that tuning of filters/delay cells remains correct.
18	BLACK CURRENT INPUT	For correct operation of the loop CURRENT information is supplied to the black current input pin.
19 20 21	BLUE OUTPUT GREEN OUTPUT RED OUTPUT	The RGB outputs are supplied to the video output stages from pins 21, 20 and 19 respectively. For nominal signals (i.e. CVBS/S-VHS, -(R-Y)/- (R-Y), TXT inputs) and for nominal control settings, then the RGB output Signal amplitudes is typically 2VBLACK_WHITE.
22	V-GUARD INPUT/ BEAM CURRENT LIMITER	**Vertical Guard** With this function, the correct working of the vertical deflection can be monitored. If the vertical deflection fails, the RGB outputs are blanked to prevent damage to the picture tube. **Beam current limiting** The beam current limiting function is realised by reducing the contrast (and finally the brightness) when the beam current reaches too high level. The circuit falls apart in two functions: - Average beam current limiting (ABL): reacting on the average content of the picture - Peak white limiting (PWL): reacting on high local peaks in the RGB signal.
23 24 25	RED INPUT GREEN INPUT BLUE INPUT	The Rin, Gin, Bin input signals (nominal signal amplitude of 700mV) are AC coupled to pin 23, 24 and 25 respectively. Clamping action occurs during burstkey period.
26	RGB INSERTION SWITCH INPUT	The table below a survey is given of the three modes which can be selected with a voltage on RGB insertion switch input pin ; Vpin26 — I²C function — Selected RGB signal 0.9V-3V — IE1=0 — RGB(internal) IE1=1 — Rin,Gin,Bin (fast insertion on pin23,24,25) > 4V — IE1=X — OSD can be inserted at the RGBout pins
27	LUMINANCE INPUT	An nominal input signal amplitude of 1 V black-white MUST be DC coupled

No	Name	Description
		to the luminance input pin 27. The pin is internally AC coupled to the luminance clamp via a capacitor of 50pF; clamping action occurs during burstkey period.
28	LUMINANCE OUTPUT	The luminance output signal is approximately I V black-white with typical output impedance of 250 ohm.
29 30	B-Y OUTPUT R-Y OUTPUT	The maximum output impedance of pins 29 and 30 is 500 Ω when PAL/NTSC signals are identified. When SECAM is identified by the SECAM add-on and no PAL/NTSC is already identified by the ASM, then the ASM sets the -(B-Y)/-(R-Y) output switch open (via DEMSW). This enables the -(B-Y)/-(R-Y) outputs of the TDA8395 to be directly connected to pins 29 and 30 respectively.
31 32	B-Y INPUT R-Y INPUT	The -(B-Y),-(R-Y) output signals (supplied from baseband delay line) are AC coupled, via a coupling capacitor of 10nF or greater, to the -(B-Y)/-(R-Y) inputs; both inputs are clamped during burstkey period.
33	SECAM REF OUTPUT	The SECAM reference output is directly connected to pin I of the TDA8395 for SECAM decoding ; it also can be used as a reference for comb. filter applications.
34 35	X-TAL 3.58 X-TAL 4.43	To ensure correct operation of both: - colour processing internal circuits, - sync calibration internal circuits, it is only allowed to have 3.6MHz Xtals on pin34: both 4.4MHz,3.6MHz Xtals are allowed on pin 35. If pin 35 is not used: then it is left open in application (also XA,XB=0,1).
36	LOOP FILTER BURST PHASE DETECTOR	One of the important aspects of the PLL is the loop filter connected to pin 36; it influences the dynamic performance of the loop.
38	CVBS OUTPUT	The output amplitude is $1V_{pp}$ (transfer gain ratio between CVBS1int or CVBS2ext or CVBS3ext/Ys-vhs and CVBSout is 1). The maximum output impedance is 250 ohm.
39	BLACK PEAK HOLD CAPACITOR	For the correct working of the black stretcher an external time constant should be added at the black peak hold capacitor input.
40	HOR OUTPUT	This open collector output is meant to drive the horizontal output stage. The output is active low, i.e. the line transistor should conduct during the low period of the output.
41	SANDCASTLE OUTPUT/ FLYBACK INPUT	Pin 41 is a combined input/output pin. The pin provides a three level sandcastle pulse. Both burstkey pulse and vertical blanking pulse are always available, the line blanking pulse is only present when the external flyback pulse is fed to this pin. The line flyback pulse, fed to this pin is used for two functions: - input signal for the PHI-2 loop and - RGB line blanking. (without flyback pulse blanking occurs only during the burstkey pulse) To ensure correct working of the delay line and SECAM add-on, the output should not be loaded with more than: - Sandcastle input delay line TDA 4665 - Sandcastle input SECAM add-on TDA 8395
42	PHI-2 FILTER / FLASH PROTECT	The loopfilter is a first order filter. This pin requires a capacitor (C) only.

No	Name	Description
		A flash protection becomes active when this pin is forced >6V. The horizontal drive is switched-off immediately. Once the voltage is <6V the horizontal drive is switched-on again via the slow start procedure.
43	PHI-1 FILTER	The loopfilter connected to pin 43 is suitable for various signal conditions as strong/weak and VCR signal. This is achieved by switching of the loopfilter time constant by changing the PHI-1 output current. Via I²C bus FOA/B, different time constants can be chosen, including an automatic mode which gives optimal performance under varying conditions.
44	GROUND	To this pin are connected the IC-substrate and horizontal output.
45	EAST-WEST DRIVE	Not used
46 47	VERT DRIVE + VERT DRIVE -	The vertical drive has a current output. The output is balanced which ensures a good common mode behavior with temperature and makes the output signal less sensitive for disturbances.
48 49	IF INPUT	The PLL frequency range is 32-60MHz with corresponding VCO frequency 64-120MHz. The IF input impedances is 2 kΩ in parallel with 3pF and matches the required load for commonly used Saw filters. A DC coupling is allowed, so no series capacitors between Saw filter and IF input are necessary.
50	EHT/OVERVOLTAGE PROTECT INPUT	Not used
51	VERT SAWTOOTH CAPACITOR	This pin requires a capacitor to ground of I00nF +/- 5%. The optimal sawtooth amplitude is 3.5V and is determined by the external capacitor and charge current. The sawtooth bottom-level is 2V.
52	REFERENCE CURRENT INPUT	This pin requires a resistor to ground. The optimal reference current is 100 µA. which is determined by this resistor.
53	AGC DECOUPLING CAPACITOR	The AGC capacitor value is 2.2 µF and has been defined for an optimal compromise between AGC speed and tilt for all AGC modes (negative/positive modulation).
54	TUNER AGC OUTPUT	This output is used to control (reduce) the tuner gain for strong RF signals. The tuner AGC is an open collector output which is acting as a variable current source to ground.
55	AUDIO	Not Used
56	DECOUPLING SOUND DEMODULATOR	This pin requires a capacitor of 10 µF connected to ground. The pin acts as a low pass filter needed for the DC feedback loop.

TDA4665(Base Band Delay Line)

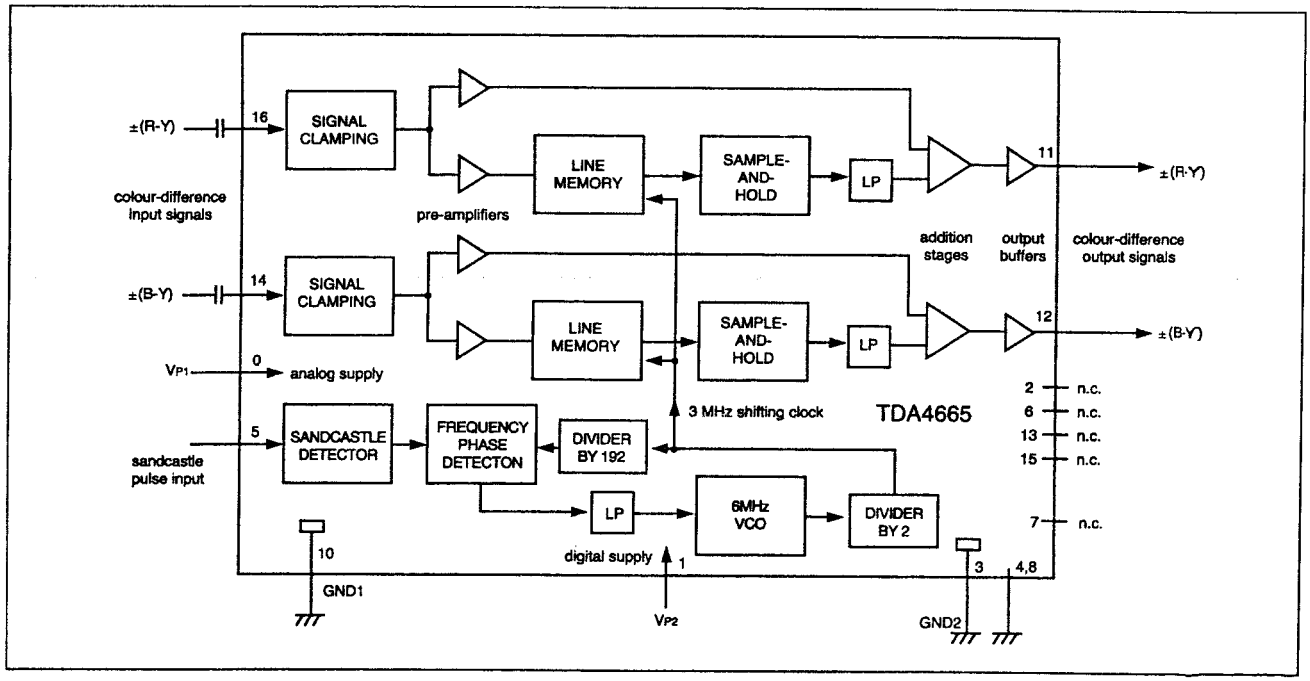
(1) Features

- Two comb. filters, using the switched-capacitor technique, for one line delay time (64µs)
- Adjustment free application
- No crosstalk between SECAM colour carriers
- Handles negative or positive colour-difference input signals
- Clamping of AC-coupled input signals(±(R-Y)and±(B-Y))
- VCO without external components
- 3MHz internal clock signal derived from a 6MHz VCO, line-locked by the sandcastle pulse (64µs line)
- Sample-and -hold circuits and low-pass filters to suppress the 3 MHz clock signal
- Addition of delayed and non-delayed output signals
- Output buffer amplifiers
- Comb. filtering functions for NTSC colour-difference signals to suppress cross-colour

(2) General Description

The TDA4661 is an integrated baseband delay line circuit with one line delay. It is suitable for decoders with colour-difference signal outputs±(R-Y)and±(B-Y).

(3)Block Diagram



(4) Pin Description

SYMBOL	PIN	DESCRIPTION
V_{p2}	1	+5V supply voltage for digital part
n.c.	2	not connected
GND2	3	ground for digital part (0V)
i.c.	4	internally connected
SAND	5	sandcastle pulse input
n.c.	6	not connected
i.c.	7	internally connected
i.c.	8	internally connected

SYMBOL	PIN	DESCRIPTION
V_{p1}	9	+5V supply voltage for analog part
GND1	10	ground for analog part (0V)
V_o (R-Y)	11	± (R-Y) output signal
V_o (B-Y)	12	± (B-Y) output signal
n.c.	13	not connected
V_i (B-Y)	14	± (B-Y) input signal
n.c.	15	not connected
V_i (R-Y)	16	± (R-Y) input signal

TDA8395 (Secam Decoder)

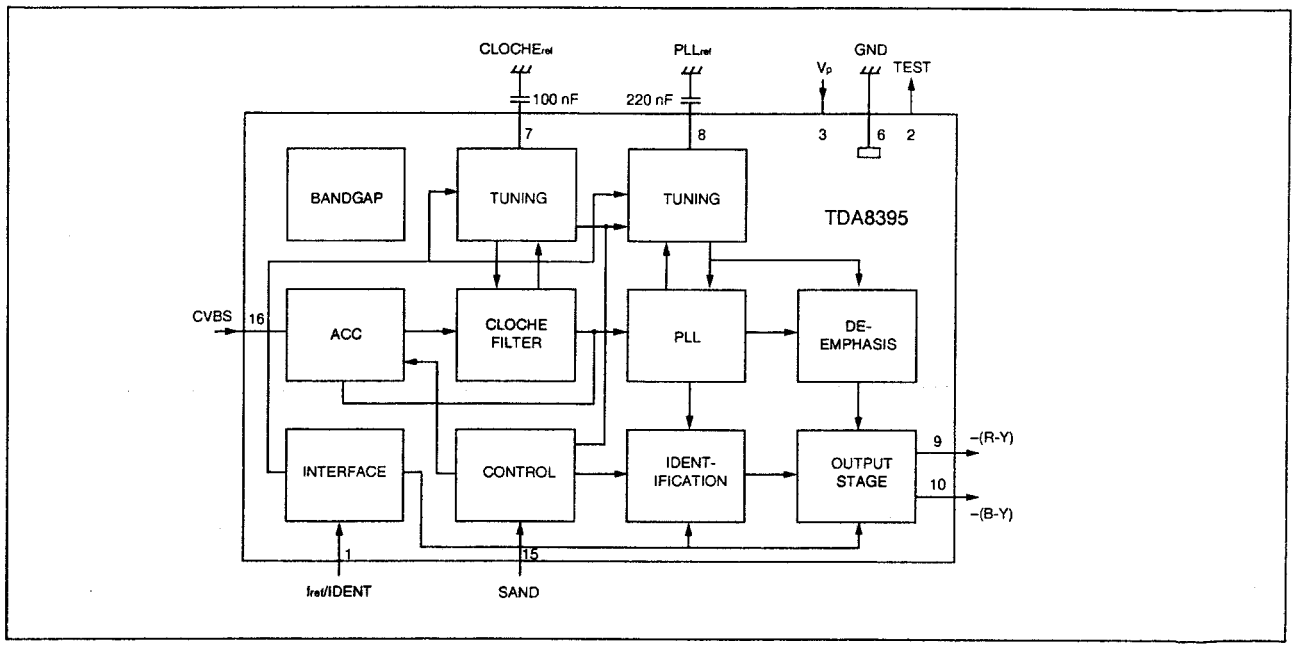
(1) Features

- Fully integrated filters
- Alignment free
- For use with baseband delay

(2) Description

The TDA8395 is a self-calibrating, fully integrated SECAM decoder. The IC should preferably be used in conjunction with the PAL/NTSC decoder TDA8362 and with the switch capacitor baseband delay circuit TDA4665. The IC incorporates HF and LF filters, a demodulator and an identification circuit (luminance is not processed in this IC).

A highly stable reference frequency is required for calibration and a two-level sandcastle pulse for blanking and burst gating.



(4) Pin Description

SYMBOL	PIN	DESCRIPTION
fp1/IDENT	1	reference frequency input/identification input
TEST	2	test output
Vp	3	positive supply voltage
n.c.	4	not connected
n.c.	5	not connected
GND	6	ground
CLOCHEref	7	Cloche reference filter
PLL ref	8	PLL reference
-(R-Y)	9	-(R-Y) output
-(B-Y)	10	-(B-Y) output
n.c.	11	not connected
n.c.	12	not connected
n.c.	13	not connected
n.c.	14	not connected
SAND	15	sandcastle pulse input
CVBS	16	video (chrominance) input

TDA6106Q (Video Output Amplifier)

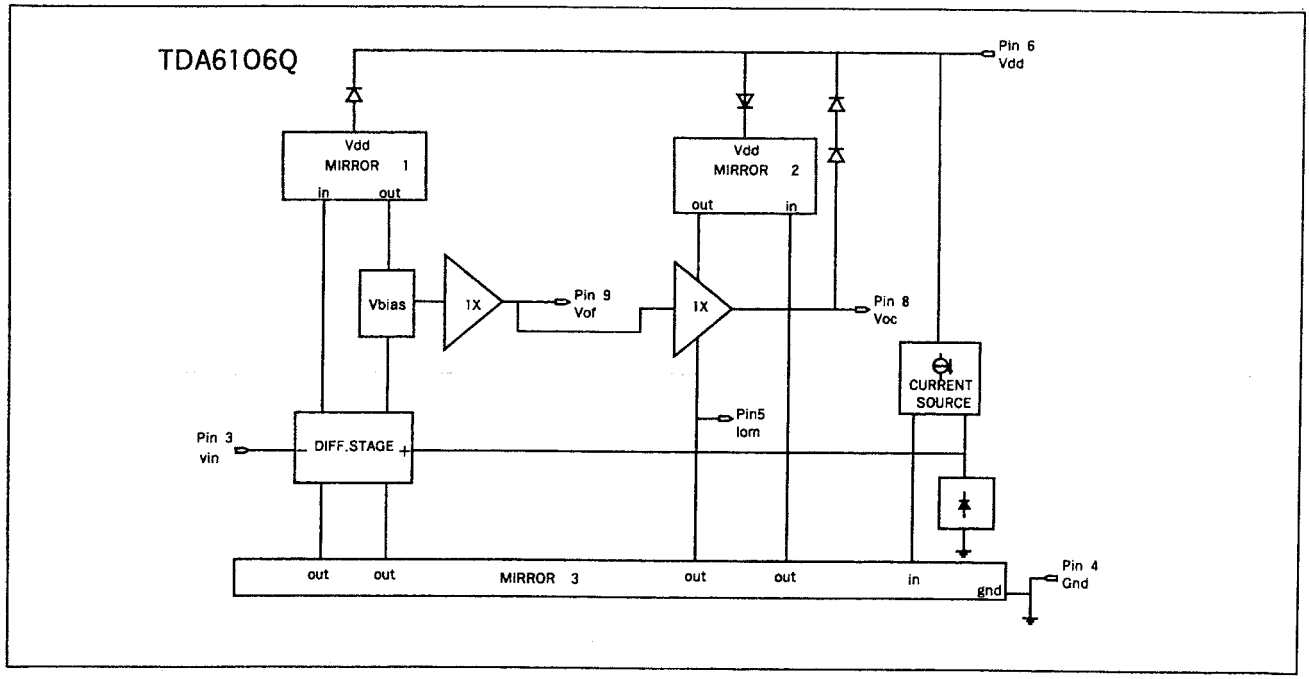
(1) General Description

The TDA6106Q is a monolithic video output amplifier (5MHz bandwidth) in a SIL 9 MP package, using high-voltage DMOS technology, and is intended to drive the cathode of CRT directly .
To obtain maximum performance, the amplifier should be used with black-current control.

(2) Feature

- Black - current measurement output for automatic black current stabilization (ABS)
- Single supply voltage of 200V
- Internal protection against positive appearing CRT flash-over discharge
- Protection against ESD
- Internal 2.5V reference circuit
- Controllable switch-off behavior

(3) Block Diagram



(4) Pin Description

PIN	SYMBOL	DESCRIPTION
1		N.C
2		N.C
3	V_{in}	inverting input
4	GND	ground, substrate
5	I_{om}	Black-current measurement output
6	V_{dd}	supply voltage high
7		N.C
8	V_{oc}	cathode output
9	V_{of}	feedback/transient output

TDA8356 (DC-coupled vertical deflection circuit)

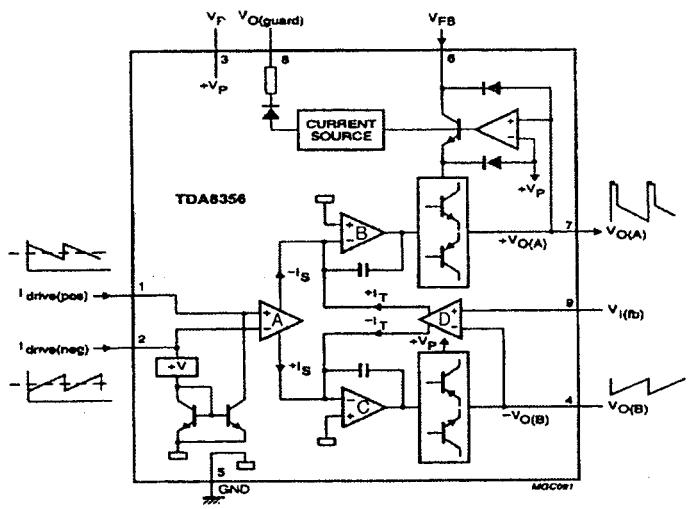
(1) General Description

The TDA8356 is power circuit for use in 90° and 110° color deflection systems for field frequencies of 50 to 120 Hz. The circuit provides a DC driven vertical deflection output circuit, operating as a high efficient class G system.

(2) Feature

- High efficient fully DC-coupled vertical output bridge circuit
- Vertical fly-back switch
- Guard circuit
- Protection against : - short circuit of the output pins (7 and 4)
  - short circuit of the output pins to V_p
- Temperature (thermal) protection
- High EMC immunity because of common mode inputs

(3) Block Diagram



(4) Pin Description

PIN	SYMBOL	DESCRIPTION
1	$I_{drive\ (pos)}$	input power stage (positive); include Ii(sb) signal bias
2	$I_{drive\ (neg)}$	input power stage (negative); include Ii(sb) signal bias
3	V_p	operating supply voltage
4	$V_{o(b)}$	output voltage B
5	GND	ground
6	V_{fb}	input fly-back supply voltage
7	$V_{o(a)}$	output voltage A
8	$V_{o(guard)}$	guard output voltage
9	$V_{I(fb)}$	input feedback voltage

TDA1519B (BTL or STEREO audio amplifier)

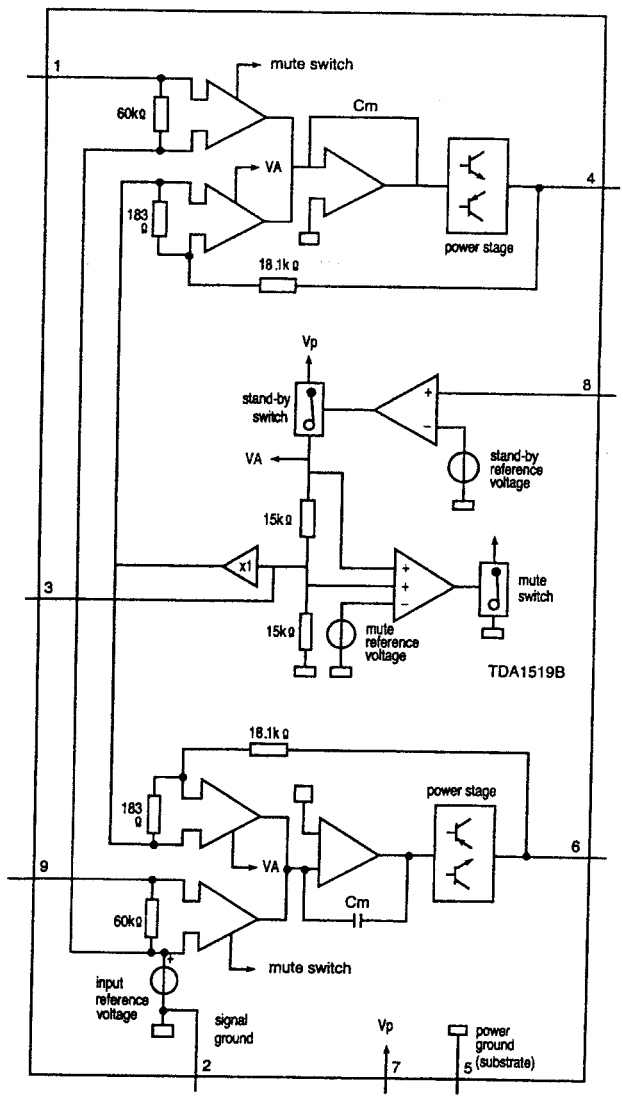
(1) Features

- Require very few external components for Bridge Tied Load (BTL)
- Stereo or BTL application
- High output power
- Low offset voltage at output(important for BTL)
- Fixed gain
- Good ripple rejection
- Mute/stand-by switch
- Load dump protection
- AC and DC short-circuit-safe to ground and VP
- Thermally protected
- Reverse polarity safe
- Capability to handle high energy on outputs (VP = 0V)
- No switch-on/switch-off plop
- Protected against electrostatic discharge
- Identical inputs(inverting and non-inverting)
- compatible with TDA1519A(except output power)

(2) General Description

The TDA1519B is an integrated class-B dual output amplifier in a 9-lead single in-line(SIL) plastic meduim power package. The device is primarily developed for car radio applications.

(3)Block Diagram



(4)Pin Description

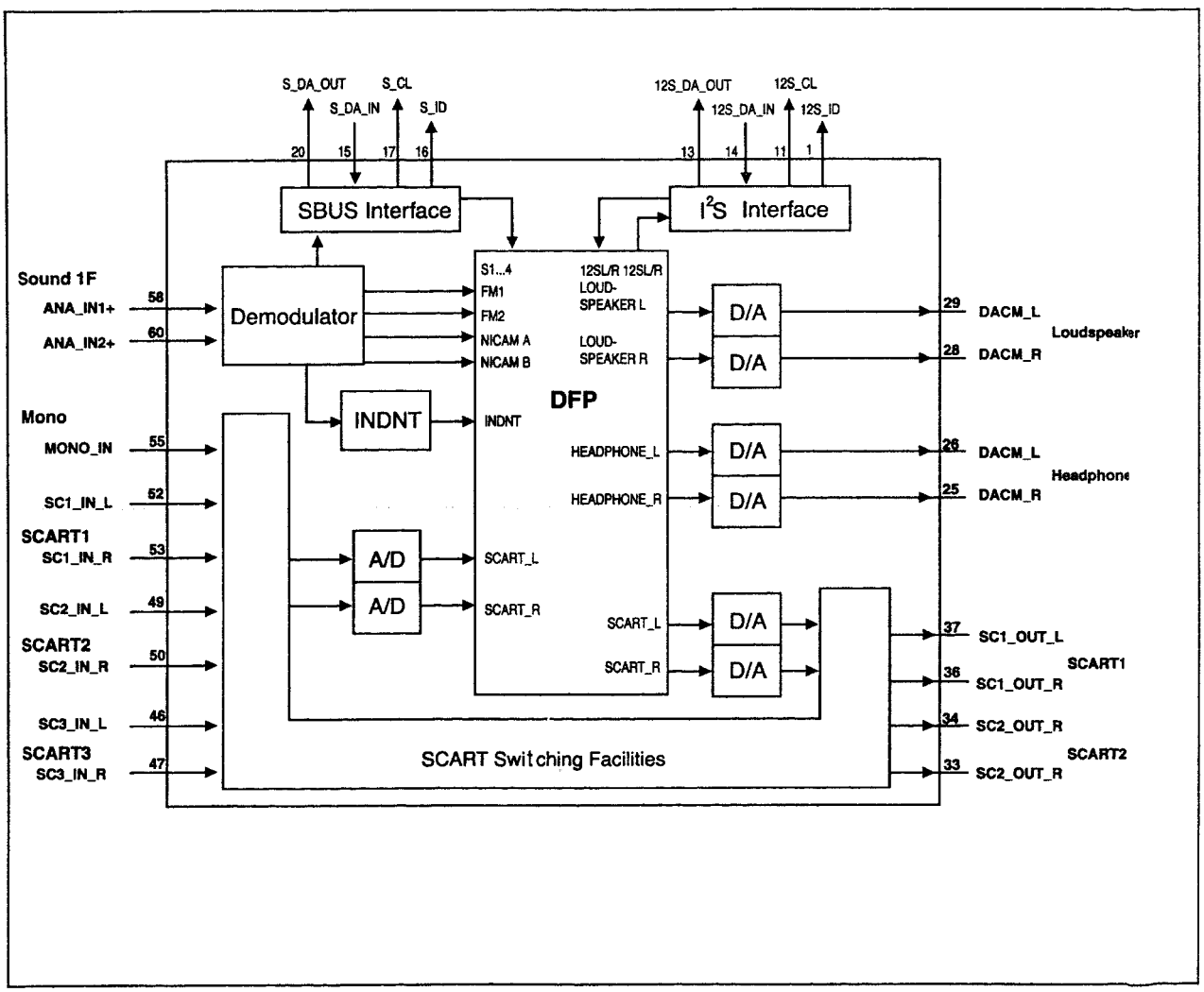
PIN	NAME	DESCRIPTION
1	NINV	non-inverting input
2	GND1	ground(signal)
3	RR	supply voltage ripple rejection
4	OUT1	output 1
5	GND2	ground(substrate)
6	OUT2	output 2
7	Vp	positive supply voltage
8	M/SS	mute/stand-by switch
9	INV	inverting input

MSP3410(Multistandard Sound Processor for NICAM & 2-Carrier)

(1) Features

- A single-chip Multistandard Sound Processor for applications in analog and digital TV sets
- Two selectable analog inputs
- Automatic Gain control for analog input
- All demoudiation and filtering is performed on chip and is individually programmable
- Adjustment of volume, balance, loudness, treble, base, base width enlargement, pseudo stereo
- Independent input selection for speaker-out and scart-out

(2)Block Diagram



(3) Description

• **Analog sound IF-Input Section**

The input pins ANA_IN1+, ANA_IN2+ and ANA_IN-offer the possibility to connect two different sound IF sources to the MSP 3410. By means of bit[8] of AD_CV either terrestrial or satellite sound IF signals can be selected. The analog-to-digital conversion of the preselected sound IF signal is done by a flash-converter, whose output can be used to control an analog automatic gain circuit(AGC), providing optimum level for a wide range of input levels. It is possible to switch between automatic gain control and a fixed(setable) input gain. In the optimum case, the input range of the AD converter is completely covered by the sound if source. Some combinatios of SAW filters and sound IF mixer IC's however show large picture components on their outputs. In this case filtering is recommended. It was found, that the high pass filters formed by the coupling capacitors at pins ANA_IN1 + and ANA_IN2 + are sufficient in most cases.

• **Quadrature Mixers**

The digital input coming from the integrated A/D converter may contain audio information at a frequency range of theoretically 0 to 9 MHz corresponding to the selected standards. By means of two programmable quadrature mixers two different audio sources, for example NICAM and FM-mono, may be shifted into baseband position. In the following the two main channels are provided to process either.

- NICAM(channel 1) and FM mono(channel 2) simultaneously or alternatively
- FM2(channel 1) and FM1(channel 2).

Two independent digital oscillators are provided to generate two pairs of sin/cos-functions.
Two programmable increments, to be divided up into Low-and High Part, determine frequency of the oscillator, which corresponds to the frequency of the desired audio carrier.

• **Lowpass Filtering Block for Mixed Sound IF Signals**

By means of decimation filters the sampling rate is reduced. Then, data shaping and/or FM bandwidth limitation is performed by a linear phase Finite Impulse Response(FIR-filter). Just like the oscillators' increments the filter coefficients are programmable and are written into the IC by the CCU via the control bus. Thus, for example, different NICAM versions can easily be implemented. Two not necessarily different sets of coefficients are required, one for channel 1(NICAM or FM2) and one for channel 2(FM1=FM-mono). Since both MSP channels are designed to process the German FM Stereo System with the same FIR coefficient set(despite 7 dB power level difference of the two sound carriers), the MSP channel 1 has an internal over all gain of 6 dB. To process two carriers of identical power level these 6 dBs have to be taken into acount by decreasing the values of the channel 1 coefficient set.

• **CORDIC Block**

The filtered sound IF signals are demodulated by transforming the incoming signals from Cartesian into polar format by means of a CORDIC processor block. On the output, the phase and amplitude is available for further processing. AM signals are derived from the amplitude information whereas the phase information serves for FM and NICAM(DQPSK) demodulation.

• **Differentiators**

FM demodulation is completed by differentiating the phase information output of the CORDIC block.

• **Lowpass Filter Block for Demodulated Signals**

The demodulated FM and AM signals are further lowpass filtered and decimated to a final sampling frequency of 32 kHz. The usable bandwidth of the final baseband signals is about 15 kHz.

• **DQPSK - Decoder**

In case of NICAM-mode the phase samples are decoded according the DQPSK-Coding scheme. The output of this block contains the original NICAM-bitstream, which is available at the N-Bus interface.

• **NICAM-Decoder**

Before any NICAM decoding can start, the MSP must lock to the NICAM frame structure by searching and synchronizing to the so-called Frame Alignment Words(FAW).
To reconstruct the original digital sound samples the NICAM-bitstream has to be descrambled, deinterleaved and rescaled. Also bit error detection and coreection(concealment) is performed in this NICAM specific block.

To facilitate the Central Control Unit CCU to switch the TV-set to the actual sound mode, control information on the NICAM mode and bit error rate are supplied by the the NICAM-Decoder. It can be read out via the I²C-Bus.

- **Analog Section and SCART Switches**

The analog input and output sections offer a wide range of switching facilities, which are shown in Fig. To realize a TV-set with 3 pairs of SCART-inputs and two pairs of SCART-outputs no external switching hardware is requied.

The switches are controlled by the ACB bits defined in the audio processing interface(see chapter "programming the audio processing part").

If the MSP 3410 is switched off by first pulling STANDBY Q low and then disconnection the 5V but keeping the 8V power supply('Standby'-mode), the switches S1, S2 and S3 maintain their position and function. This facilitates the copy from selected SCART-inputs to SCART-outputs in the TV-sets standby mode.

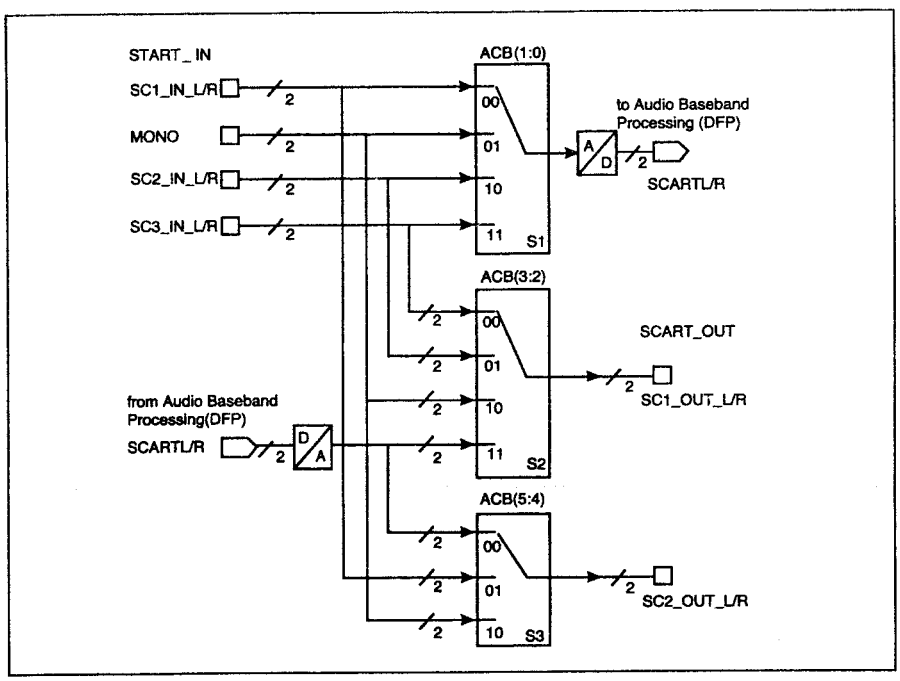


Fig. SCART-Switching Facilities
Bold lines determine the default configuration

In case of power-on start or starting from standby, the IC switches automatically to the default configuration, shown in the figure above. This action takes place after the first I²C transmission into the DFP part.

By transmitting the ACB register first, the default setting mode can be changed.

- **MSP 3410 Audio Baseband Processing**

By means of the DFP processor all audio baseband functions are performed by digital signal processwing(DSP). The DSP functions are grouped into three processing parts: Input preprocessing, channel selection and channel postprocessing.

The input preprocessing is intended to prepare the various signals of all input sources in order to form a standardized signal at the input to the channel selector. The signals can be adjusted in volume, are processed with the appropriate deemphasis and are dematrixed if necessary.

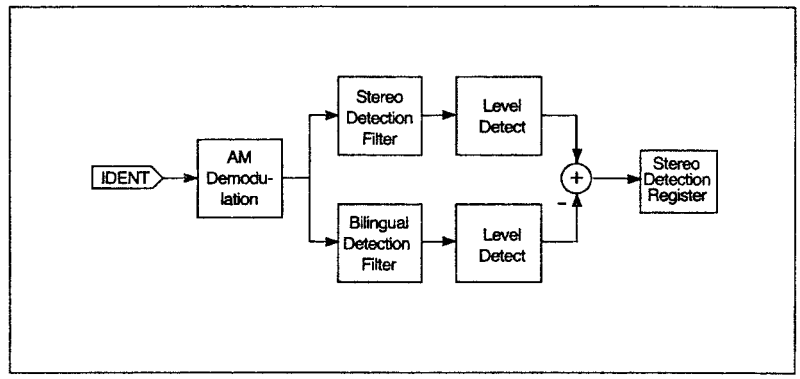
Having prepared the signals that way, the channel selector makes it possible to distribute all possible source signals to the desired output channels.

Of special importance is the ability to route in an external coprocessor for special effects like graphic equalizer, surround processing and sound field processing. Routing can be done with each input source and output channel via the I²S inputs and outputs.

All input and output signals can be processed simultaneously with the exception that FM2 cannot be processed at the same time as NICAM. Note that the NICAM input signals are only available in the MSP 3410 version. While processing the adaptive deemphasis, no dual carrier stereo(German or Korean) of NICAM processing is possible. Identification values are not valid either.

- **Dual Carrier FM Stereo/Bilingual Detection**

In the German and Korean TV standard, audio information can be transmitted in three modes: Mono, stereo or bilingual. To obtain information about the current audio operation mode, the MSP 3410 detects the so-called identification signal. Information is supplied via the Stereo Detection Register to an external CCU.



(4) Pin Description

Pin	PIN Name	Description
1	AUD_CL_OUT	Audio clock output
2	CW_CL	Pay-TV control clock
3	CW_DA	Pay-TV control data
4	D_CTR_OUT1	Digital control output 1
5	D_CRT_OUT0	Digital control output 0
6	ADR_SEL	Control bus address select
7	STANDBYQ	Standby(low-active)
8	D_CTR_IN 0	For future use
9	I²C_CL	I²C clock
10	I²C_DA	I²C clock
11	I²S_CL	I²S clock
12	I²S_WS	I²S wordstrobe
13	I²S_DA_OUT	I²S data input
14	I²S_DA_IN	I²S data input
15	S_DA_IN	SBUS data input
16	S_ID	SBUS ident
17	S_CL	SBUS clock
18	DVSUP	Digital power supply + 5V
19	DVSS	Digital ground
20	S_DA_OUT	SBUS data output(FM/NICAM-test)

Pin	PIN Name	Description
21	FRAME	NBUS frame
22	N_CL	NBUS clock
23	N_DA	NBUS data
24	RESETQ	Power-on-reset
25	DACA_R	Analog output AUX, right
26	DACA_L	Analog output AUX, leftt
27	VREF2	Reference ground2 high voltage part
28	DACM_R	Analog output MAIN, right
29	DACM_L	Analog output MAIN, left
30	TESTIO2	Test pin 2
31	C-DACS-R	SCART output capacitor to ground
32	C-DACS-L	SCART output capacitor to ground
33	SC2_OUT_R	SCART output2, right
34	SC2-OUT_L	SCART output2, left
35	VREF1	Reference ground 1 high voltage part
36	SC1_OUT_R	SCART output1, left
37	SC1_OUT_L	SCART output1, left
38	CAPL_A	Volume capacitor AUX
39	AHVSUP	Analog power supply 8V
40	CAPL_M	Volume capacitor MAIN
41	AHVSS	Analog ground
42	AGNDC	Analog reference voltage high voltage part
43	PDMC1	Capacitor to BAGNDI
44	PDMC2	Capacitor to BAGNDI
45	BAGNDI	Buffered AGNDC
46	SC3_IN_L	Scart input3 in, left
47	SC2_IN_R	Scart input3 in, right
48	ASG2	Analog Shield Ground2
49	SC2_IN_L	Scart input2 in, left
50	SC2_IN_R	Scart input2 in,right
51	ASG1	Analog Shield Ground1
52	SC1_IN_L	Scart input1 in, left
53	SC1_IN_R	Scart input1 in,right
54	VREFTOP	Reference voltage IF A/D converter
55	MONO_IN	Mono input
56	AVSS	Analog ground
57	AVSUP	Analog power supply + 5V
58	ANA_IN1+	IF input 1
59	ANA_IN-	IF common

Pin	PIN Name	Description
60	ANA_IN2+	IF input2(if NAN_IN1+is used only, connect to AV SS with 50pF Capacitor
61	TESTIO1	Test pin 1
62	XTAL_IN	Crystal oscillator
63	XTAL_OUT	Crystal oscillator
64	DMA_SYNC	DMAC-sync:signal

TDA4445B(Quasi Parallel Sound Processor)

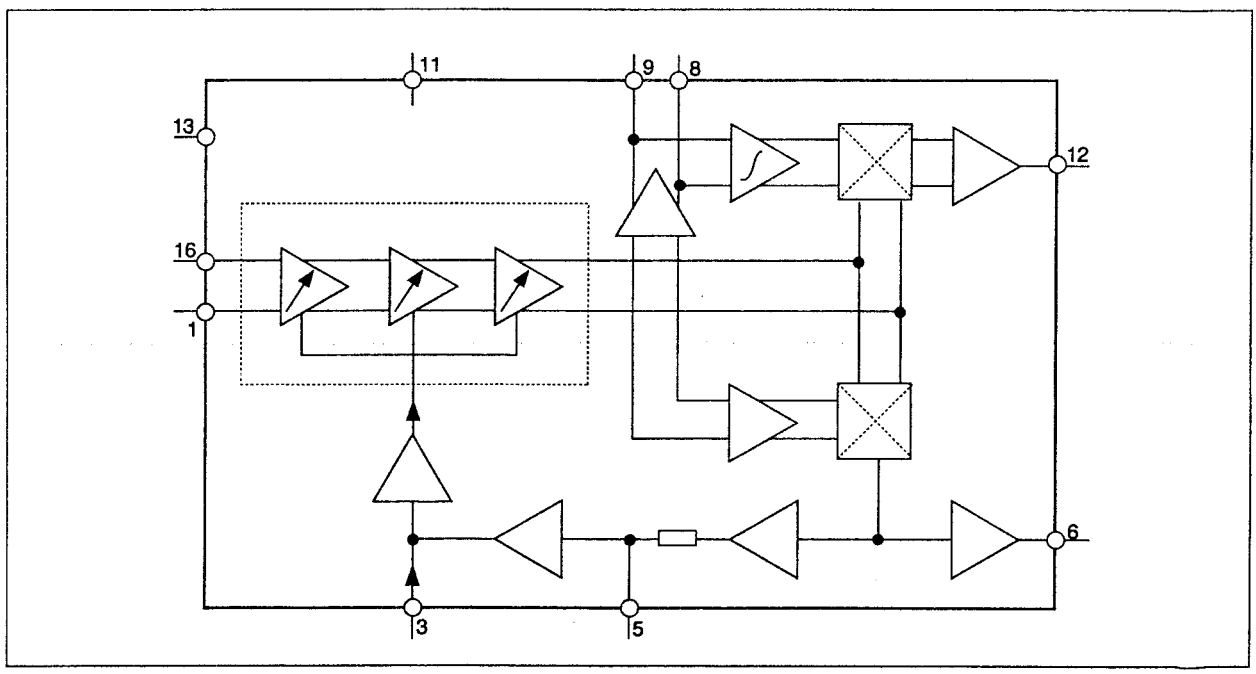
(1) Features

- Very high input sensitivity
- Excellent signal to noise ratio
- Fast averaged AGC
- IF amplifier can be switched off for VTR mode
- Output signal stabilized against supply voltage variations
- Very few external components
- Targeting bistandard application
- Low AM distortion

(2)General Description

The TD4445B is quasi parallel sound processor with quadrature intercarrier demodulator.

(3) Block Diagram



(4) Pin Description

PIN	DESCRIPTION
1, 16	IF input
3	IF AGC time constant
8, 9	Tuned circuit
11	Supply voltage
12	Sound-IF-output
13	Ground
2,4,7,10 14,15	not be connected
5	Average capacitor
6	AF output

STR-S5707 (Hybrid IC for a Switching Regulator)

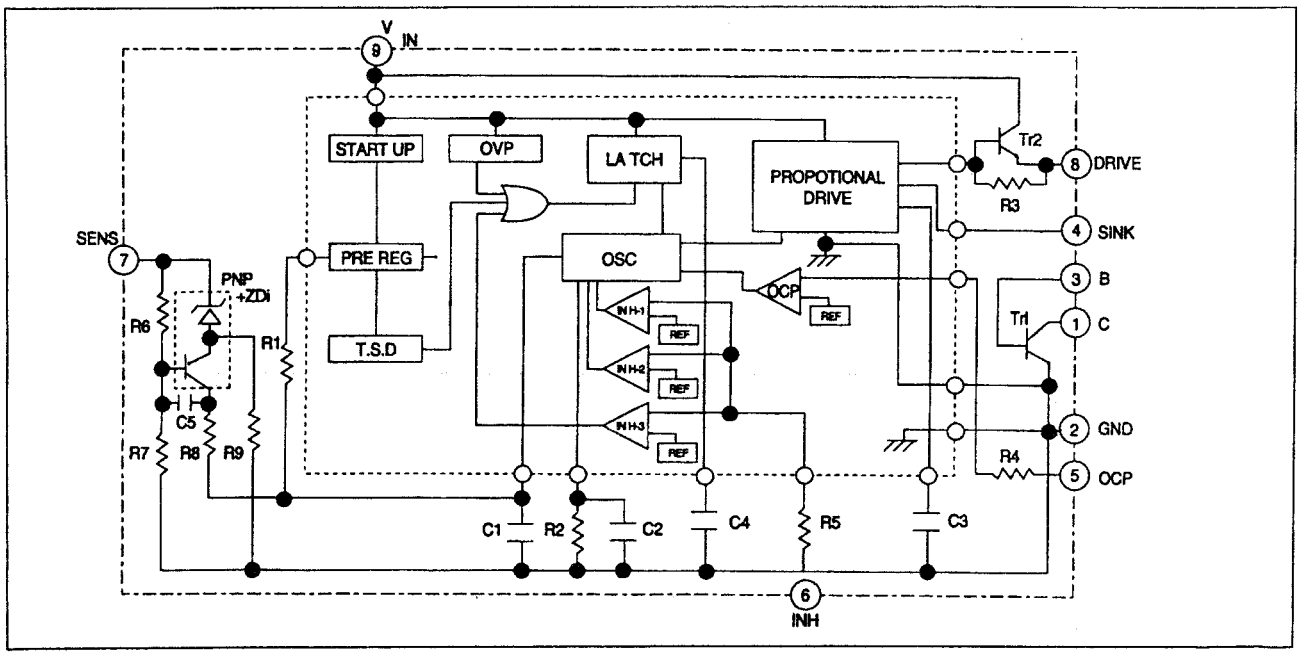
(1) General Description

The STR-S5707 is a Hybrid IC with a built in power transistor and a separate excitation control IC, designed for converter type switching mode power supply applications.
The IC is capable of quasi-resonant mode and requires small number of external component.

(2) Feature

- Small SIP isolated package : Resin sealed type (transfer mold)
- Lower power dissipation at a lighter load
- Many protection function : - Pulse-by-pulse over current protection
  - Over-voltage protection with a latch
  - Thermal protection with a latch
- These protection functions are incorporated and can be latched with an external signal.

(3) Block Diagram



(4) Pin Description

PIN	NAME	SYMBOL	DESCRIPTION
1	Collector	C	Collector of power Tr
2	Ground	GND	ground (Emitter of power Tr)
3	Base	B	Base of power Tr
4	Sink	SINK	Base current (IS) input
5	Over-current protection	OCP	over-current sensing signal input
6	Inhibit Latch	INH	input for synchronizing OFF time and latch circuit operation
7	Sensing	SENS	constant voltage control signal input
8	Drive	DRIVE	Base drive current (ID) output
9	Vin	VIN	supply voltage for control circuit

Electrical Characteristics of Control Part (Ta=25°C)

Description	Terminal	Symbol	Rating			Unit
			MIN	TYP	MAX	
On-state Voltage	9-2	$V_{IN(ON)}$	7.6	8	8.4	V
Off-state Voltage	9-2	$V_{IN(OFF)}$	4.6	4.9	5.2	V
Operating Circuit Current	9-2	$I_{IN(ON)}$	15	—	28	mA
Stand-by Circuit Current	9-2	$I_{IN(OFF)}$	—	—	200	μA
On Time	—	T_{ON}	33	—	41	μsec
Off Time	—	T_{OFF}	45	—	55	μsec
OCP terminal Threshold Voltage	6-2	V_{OCP}	-1.12	-1	-0.88	V
INH terminal Threshold Voltage 1	8-2	V_{INH-1}	0.65	0.75	0.85	V
INH terminal Threshold Voltage 2	8-2	V_{INH-2}	—	1.4	2..0	V
INH terminal Threshold Voltage 3	8-2	V_{Latch}	3.2	5.1	5.8	V
OVP Operating Voltage	9-2	$V_{IN(OVP)}$	9.2	—	10.7	V
Latch Circuit Sustaining Current	9-2	I_H	—	—	500	μA
Latch Circuit Cancellation Voltage	9-2	$V_{IN(La.OFF)}$	2.5	3.1	—	V
MIC Thermal Shutdown Starting Temp	—	$T_{j(TSD)}$	125	150	—	°C
Fixed Reference Voltage	7-2	V_S	32.0 ± 0.3			V
Temperature Coefficient of Reference Voltage	7-2	—	—	+2.5	—	mV/°C

Electrical Characteristics of Power Transistor Part(Trl) (Ta=25°C)

Description	Terminal	Symbol	Rating			Unit
			MIN	TYP	MAX	
Collector Saturation Voltage	1-2	$V_{CE(sat)}$	—	—	0.4	V
Collector Cutoff Current	1-2	I_{CEX}	—	—	100	μA
Base-Emitter saturation voltage	3-2	$V_{BE(sat)}$	—	—	1.5	V
DC Current Gain	—	h_{FE}	29	—	61	—
Thermal Resistance	—	θ_j-F	—	—	1.3	°C/W
Switching Time	1-2	ts	—	—	15	μsec
	1-2	tf	—	—	0.5	

TDA8138 (5.1V+12V regulator with Disable and Reset)

(1) General Description

The TDA8138 is a monolithic dual positive voltage regulator designed to provide fixed precision output voltages of 5.1V and 12V at currents up to 1A.

A internal reset cuicuit generates a reset pulse when the output 1 decrease below the regulated voltage value.

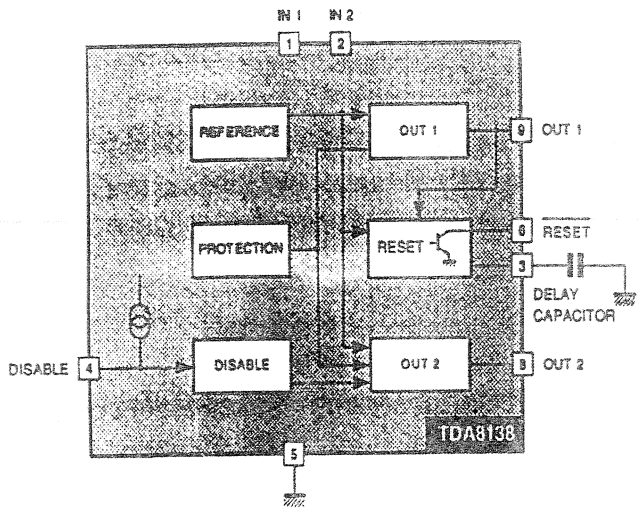
Output 2 can be disabled by TTL input.

Short circuit and themal protections are included.

(2) Feature

- output currents up to 1A
- fixed precision Output 1 voltage 5.1V ±2%
- fixed precision Output 2 voltage 12V ±2%
- output 1 with Reset facility
- output 2 with Disable by TTL input
- short circuit protection at both outputs
- thermal protection
- low drop output voltage

(3) Block Diagram



(4) Pin Description

PIN	SYMBOL	DESCRIPTION
1	V in 1	input 1
2	V in 2	input 2
3	C e	delay capacitor
4	V dis	disable
5	GND	ground
6	RST	reset
7		n.c
8	V out 2	output 2 (12V)
9	V out 1	output 1 (5.1V)

GMS30112-R098 (4-bit Single Chip Microcomputer for Remote control)

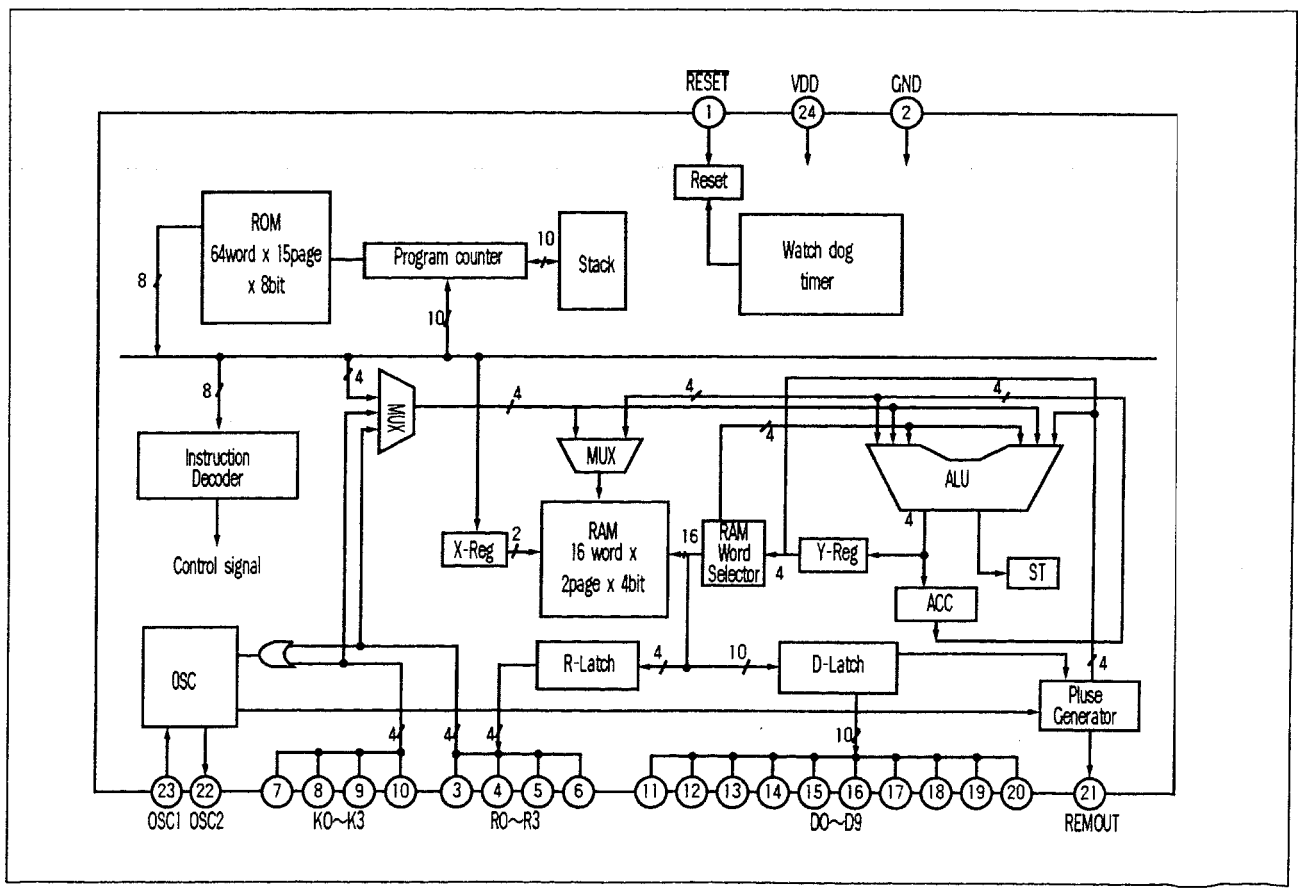
(1) General Description

The GMS30112-R098 is 4-bit single chip CMOS microcomputer.

(2) Feature

- program memory : 1024 bytes
- data memory : 32 x 4 bits
- 43 types of instruction set
- 3 levels of subroutine nesting
- 1 bit output port for a large current (REMOUT signal)
- operating frequency : 300kHz - 1 MHz
- instruction cycle : 12.5 usec @ 480kHz
- CMOS process (single 3.0 V power supply)
- stop mode (through internal instruction)
- released stop mode by key input (masked option)
- built in capacitor for ceramic oscillation circuit (masked option)
- built in a watch dog timer(WDT)
- low operating voltage (2.0 V to 4.0 V)

(3) Block Diagram



(4) Pin Description

PIN	SYMBOL	DESCRIPTION
1,2,3,4	K0,K1,K2,K3	4 bit input port with built in pull up resistor
5,6,7,8,9,10	D0,D1,D2,D3,D4,D5	10 bit output port which can be set or reset pin by pin independently. The output structure is N-channel open drain.
11	REMOUT	remote control signal output port which has high current driving capability
12	OSC 2	oscillator output
13	OSC 1	oscillator input
14	Vdd	2-4V power supply
15	RESET	reset signal input which is a low active
16	GND	ground
17,18,19,20	R0,R1,R2,R3	4 bit programmable I/O port

TOP210(Three-terminal Off-line PWM Switch)

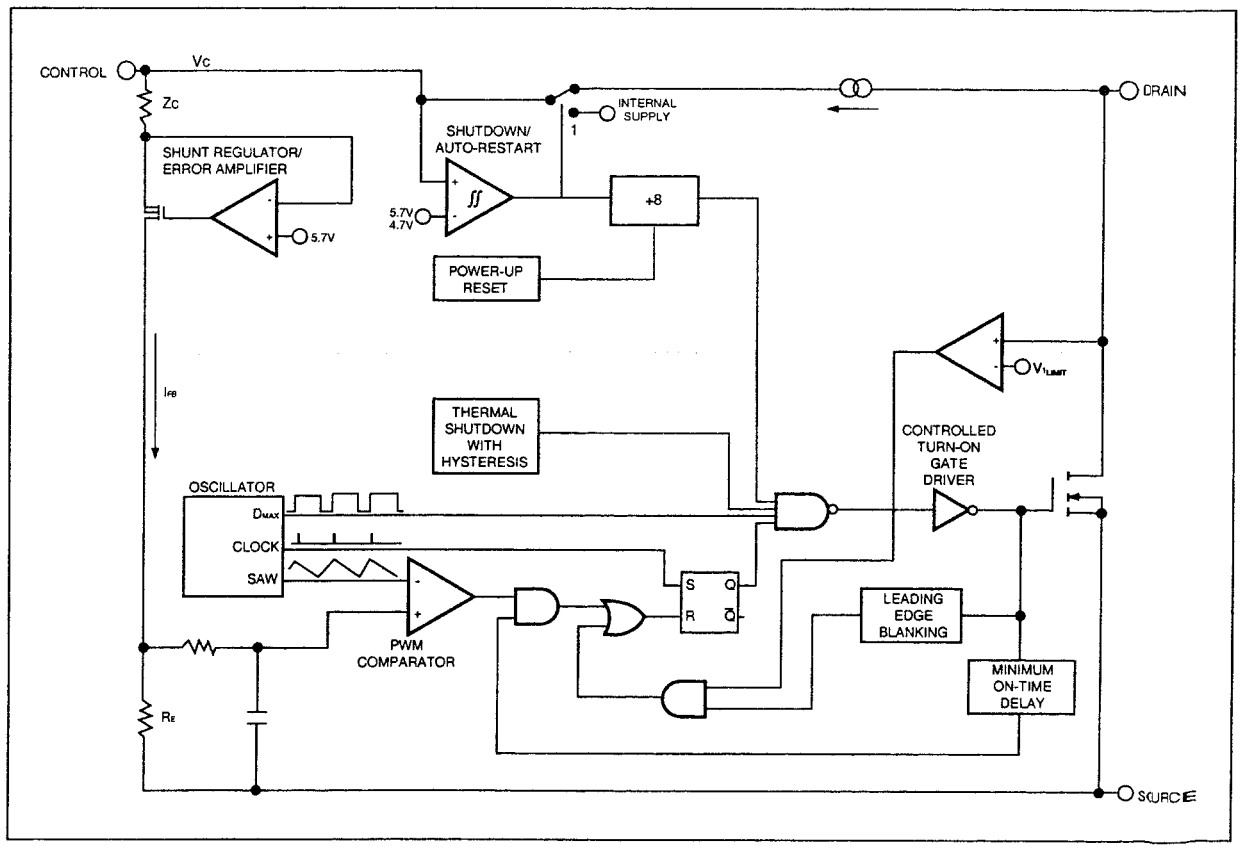
(1) General Description

The TOP210 is stand-by power supplies for Green or energy efficient products.

(2) Features

- The TOP210 is intended for 100/110/230 VAC off-line Power Supply applications in the 0 to 8W (0 to 5W universal) range.
- Controlled MOSFET turn-on.
- CMOS controller/gate driver consumes only 6 mW.
- Integrated PWM Controller and 700 V MOSFET in industry standard eight pin DIP package.
- Only one external capacitor needed for compensation, bypass and start-up/auto-restart functions.
- Auto-restart and cycle by cycle current limiting functions handle both primary and secondary faults.
- On-chip thermal shutdown with hysteresis protects the entire system against overload.

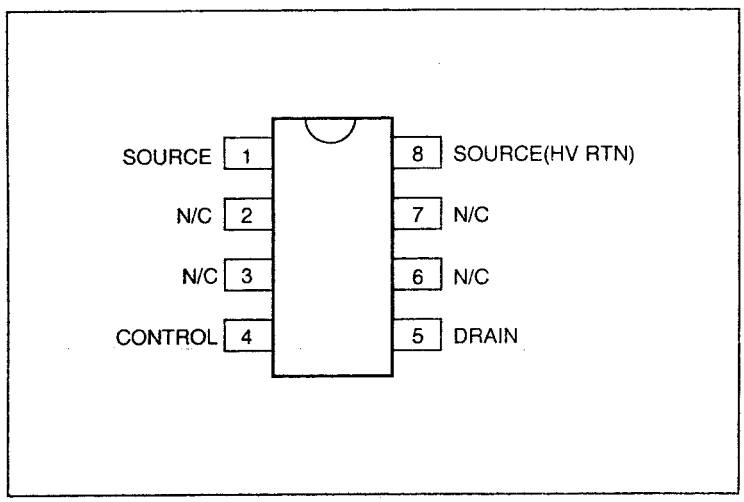
(3) Block Diagram



(4) Pin Description

PIN	SYMBOL	DESCRIPTION
1	SOURCE	Internally connected to output MOSFET source
2	N/C	Not connected
3	N/C	Not connected
4	CONTROL	Error amplifier and feedback current input pin
5	DRAIN	Output MOSFET drain connection
6	N/C	Not connected
7	N/C	Not connected
8	SOURCE (HV RTN)	Output MOSFET source connection for high voltage return

(5) Pin Configuration



■ Circuit Description

Vision IF amplifier, AFC, video demodulator

The IF signal from the tuner is fed through a SAW filter to the differential IF input (pin 48 and 49).
The first IF stage consists of 3 AC-coupled amplifiers with a total gain control range of over 66 dB.
The reference carrier for the video demodulator is obtained by a PLL carrier regenerator
(eliminating notch filter compromises, as in reference tuned circuits for passive carrier regeneration).
Only an oscillator coil is needed(pin 3 and 4) that can be aligned via I²C-bus to the double IF frequency.

The AFC information is derived from the VCO control voltage of the IF-PLL and can be read via I²C-bus.
Bit AFB toggles when the picture carrier is exactly at the desired IF frequency (= half the aligned IF-PLL frequency).
AFA is active in a window around this point.
For fast search-tuning applications this window can be increased by a factor 3 (AFW bit).

Tuner A.G.C.

The automatic gain control (A.G.C.) circuit operates on top sync level at negative modulated signals
or on peak white level at positive modulation, selected by MOD bit.
The tuner A.G.C. is controlled via pin 54.
The tuner A.G.C. take over point (T.O.P.) can be set over a wide range: 0.8 mV_{rms} .. 80 mV_{rms}
IF input signal amplitude.
The tuner AGC output may have to operate above Vcc of TDA8374.
Therefore pin 54 is an open collector output, that can operate from 0.3 up to Vcc+ 1 Volt
(at > 2 mA sink current)

Source select switch

TDA8374 input switch can select one of the following sources ;

pin 13 front-end : CVBS I int
pin17 : CVBS 2 ext
pin 11, pin I0 : Y S-VHS, C S-VHS

Selected signal is available at the CVBS output pin 38, in case of Y/C input Y+C are added.
It drive teletext and the TDA8395 SECAM add-on.
For S-VHS applications, the Y,C input can be selected, independent of the CVBS source switch.
TDA8374 Y,C inputs are selected, while the source switch outputs CVBS I int or CVBS 2 ext on CVBS out.

Horizontal synchronization and protection

The synchronization separator adapts its slicing level in the middle between top-sync and black level of the CVBS signal.
The separated synchronization pulses are fed to the first phase detector and to the coincidence detector.
The ϕ-1 loop gain is determined by the components at pin 43 (C+RC).
The coincidence detector detects whether the horizontal line oscillator is synchronized to the incoming video.
The line oscillator is a VCO-type, running at twice the line frequency.
It is calibrated with the X-tal oscillator frequency of the colour decoder and has a maximum deviation of 2% of the nominal frequency, so no alignment is-needed.
Calibration is done at start up(the TDA8374 must first know what colour X-tals are connected, bits XA and XB) and after synchronization loss (ϕ-1 coincidence detector "Sync Locked" bit SL).

The second phase detector ϕ-2 locks the phase of the horizontal driver pulses at output pin 40 to the horizontal fly-back pulse at input pin 41 .
This compensates for the storage time of the horizontal deflection transistor.
The ϕ- 2 loop filter (C) is externally connected to pin 42.
The horizontal phase can be given a static off set via I²C-bus (HSH "horizontal shift")
A dynamic correction is possible by current feedback into the ϕ- 2 loop filter capacitor.

To protect the horizontal deflection transistor, the horizontal drive is switched off immediately when a power failure (" Power-On Reset " bit POR) is detected.
The power failure may have corrupted the contents of the internal data registers, so the TDA8374 should be started up again.

The TDA8374 has a separate supply input (pin 37) that only used as a clean supply voltage for the horizontal oscillator circuits.

Vertical synchronization

The vertical sawtooth generator drives the vertical output.
It uses an external capacitor at pin 51 and a current reference resistor at pin 52.
The TDA8374 vertical drive has differential current outputs for DC-coupled vertical output stage, like the TDA8356 .
At TDA8356 input pins I and 2 this current is converted into a drive voltage via a resistor.

Geometry processing

With the TDA8374 is possible to implement automatic geometry alignment, because all parameters are adjusted via the I²C bus.
The deflection processor of the TDA8374 offers the following five controls;

- Horizontal shift
- Vertical slope.
- Vertical amplitude
- Vertical S-correction
- Vertical shift

Colour decoder

The colour decoder contains an alignment-free X-tal oscillator, a dual killer circuit and colour difference demodulators.
Together with the TDA8395 SECAM add-on a multi standard PAL/SECAM/NTSC decoder can be built with automatic recognition.
Which standard can be decoded depends on the external X-tals used.
Two X-tal pins (34 and 36) are present so normally no external switching is required.
The I.C. must be told which X-tals are connected (bits XA and XB).
This is important, because the X-tal frequency of the colour decoder is also used to calibrate many internal circuit.

The burst phase detector locks the X-tal oscillator with the chroma burst signal.
The phase detector operates during the burst key period only, to prevent disturbance of the PLL by the chroma signal.
Two gain modes provide:

- Good catching range when the PLL is not locked.
- Low ripple voltage and good noise immunity once the PLL has locked

The killer circuit switches-off the R-Y and B-Y demodulators at very low input signal conditions (chroma burst amplitude).
A hysteresis prevents on/off switching at low, noisy signals.

Color standard	pin34	pin35	XA	XB
PAL4.43/SECAM + NTSC-4.43	none	4.43	1	0
PAL4.43/SECAM + NTSC-M	3.58	4.43	1	1

Integrated video filters

The TDA8374 has alignment-free internal luminance delay, chroma bandpass and chroma trap.
They are implemented as gyrator circuits tuned by tracking to the frequency of the chroma X-tal oscillator.
The chroma trap in the Y signal path is by-passed when Y/C input is selected (S-VHS).
For SECAM an extra luminance delay is build-in, for correct delay of the luminance signal.

RGB output and black current stabilization

The colour difference signals (R-Y, B-Y) are matrixed with the luminance signal (Y) to obtain the RGBout output signals (pins 19,20,21).
In the TDA8374 the matrix type automatically adapts to the decoded standard (NTSC,PAL) .
Linear amplifiers are used to interface external RGB in signals (pins 23,24,25) from the SCART connector.
These signals overrule the internal RGB signals when the data insertion pin 26 (FBI) is switched to a level between 1.0V and 3.0V.

The contrast and brightness control and the peak white limiter operate on both internal and external RGB signals
R,G and B each have their own, independent gain control to compensate for the difference in phosphor efficiencies of the picture tube: so called "white point" adjustment.
The nominal amplitude is about 2V black to white, at nominal input signals and control settings.

TDA8374 has a black current stabilization loop, that automatically adjust the black level to the cut-off voltage of the picture tubes three gun cathodes.
Since no current is flowing when the voltage the cathode is equal to the cut-off voltage of the tube, the loop stabilizes at a very small gun current.
This "black current" of the three guns is measured internally and compared with a reference current, to adjust the black level of RGBout.
The black level loop is active during 4 lines at the end of the vertical blanking.
In the first line the leakage current is measured (max. acceptable 100 μA).
In the next three lines the black levels of the three guns are adjusted.
The nominal value of the 'black current' is 10 μA.
The ratio of the 'black currents' for the 3 guns tracks automatically with the white point adjustment, so the back-ground colour is the same as the adjusted white point.

At switch-on of the TV receiver the black current stabilization circuit is not yet active and RGBout are blanked.
Before the first measurement pulses appear, 0.5 sec delay ensures that the vertical deflection is active, so the pulses will not be visible on the screen.
During the measuring lines RGBout will supply 4V pulses to the video output stages.
The TDA8374 waits until the black current feedback input (pin 18) exceeds 200 μA, which indicates that the picture tube is warm-up.
Then the black current stabilization circuit is active.
After a waiting time of about 1.0 sec, the blanking of RGBout is released.

Tuning

The AFC information of the TDA8374 is not available as an analogue voltage.
Automatic following (=frequency tracking, AFC) can be done via the I²C-bus by software.
The TDA8374 AFC window is typically 80 kHz wide.
This value is made higher than the 62.5 kHz tuning step, to prevent an automatic following loop from continuously adapting the tuning frequency..
With this AFC window ($\pm$40 kHz) the maximum tuning error is less than 62.5 kHz.
For high speed search-tuning-algorithms, the AFC window can be widened to 240 kHz via bit AFW.

TDA8395 SECAM decoder

The TDA8395 is an alignment-free SECAM colour decoder, including a Cloche filter, demodulator and line identification circuit.

The Cloche filter is a gyrator-capacitor type.
Its frequency is calibrated in the vertical retrace period.
The calibration reference(pin 1) is obtained from the TDA8374 color X-tal oscillator (pin 33).
Pin 7 is a decoupling for the Cloche reference.
The voltage change at this pin due to leakage currents should be lower than 10 mV, during field scan, resulting in a capacitor of minimal 100 nF.
Pin 8 is the reference capacitor for the PLL.
The voltage variation during field scan at this pin should be lower than 2 mV , resulting in a capacitor of 220 nF.

The sandcastle input (pin 15) is connected to TDA8374 pin 41 and is used for generation of the blanking periods and provides clock information for the identification circuit.
The CVBS source select output (TDA8374 pin 38) supplies SECAM chroma to pin 16 of the TDA8395.
This is demodulated by a PLL demodulator, that uses the reference frequency at pin 1 and a bandgap reference to obtain the desired demodulation characteristic.

If the digital line identification in theTDA8395 detects SECAM, pin 1 will sink a current of 150 (A out of TDA8374 SECAMref pin 33.
When the TDA8374 has not detected PAL or NTSC, it will respond by increasing the voltage at pin 33 from 1.5V to 5V.
Now the TDA8374 color difference outputs pin 30 and 29 are made high-ohmic and the TDA8395 output pin 9 and 10 are switched on.
These outputs will be disconnected and high-ohmic when no SECAM is detected for two frame periods, the decoder will be initialized before trying again.

SECAM-L and -L' application

For SECAM-L and L' the TDA8374 has to be switched to positive modulation via I²C-bus bit MOD.
SECAM-L' signals only occur in VHF band I and have their picture and sound carrier interchanged, compared to SECAM-L/PAL channels.

For SECAM-L' the IF picture carrier is situated at 34.5 MHz and the AM-sound carrier at 41MHz.
Therefore the IF-PLL reference has to be tuned away from 38.9 to 34.5 MHz.
This can be done via I²C-bus sub-address 15hex (IF-PLL).

The AM sound output is inserted at TDA8374 external audio input pin via the SCART plug.
When bit MOD selects positive modulation for SECAM-L/L', the TDA8374 automatically switches to external audio.

Base band delay line TDA4665

TDA4665 is an integrated double baseband delay line of 64 µS.
It couples to the TDA8374 and TDA8395 without any switches or alignments.
The TDA4665 consist of two main blocks:

- Two delay lines of 64 µs in switched capacitor technique
- Internal clock generation of 3 MHz, line locked to the sandcastle pulse

The TDA4665 operates according to the mode demanded by the colour transmission standard:

- For PAL it operates as geometric adder to satisfy the PAL demodulation requirements
- In NTSC mode it reduces cross-colour interference (comb.-filtering)
- For SECAM it repeats the colour difference signal on consecutive horizontal scan lines.

A sandcastle pulse is connected to pin 5.
The top pulse voltage (should not exceed 5 V) can be directly coupled to the 5 V sandcastle output of the TDA8374.

The R-Y and B-Y colour difference signals (from TDA8374 pins 30 and 29) are AC-coupled and clamped by the input stages at pins 16 and 14.
An internal 6 MHz Current controlled oscillator is line locked via a PLL to the sandcastle pulse at pin 5.
This clock drives the delay lines to obtain the required 64 μsec.
Sample and hold low pass filters supress the clock signal.
The original and the delayed signals are added, buffered and fed to the output pins 11 and 12.
These are AC-coupled to the R-Y and B-Y colour difference input pin 32 and 31 of TDA8374.

The TDA4665 needs a 5 V supply voltage on pin 1 for the digital part and on pin 9 for the analog part.

TDA8356 vertical deflection.

The TDA8356 is a vertical deflection circuit.
It can be used in 90 deflection systems with frame frequencies from 50 up to 120 Hz
With its bridge configuration the deflection output can be DC coupled with few external components.
Only a supply voltage for the scan and a second supply for the flyback are needed.
The TDA8356 can drive max. 2A.

The vertical drive currents of TDA8374 pins 47 and 46 are connected to input pins 1 and 2 of the TDA8356.
The currents are converted into a voltage by a resistor between pins 1 and 2.
Pin 2 is on a fixed DC level (internal bias voltage) and on pin I the drive voltage can be measured (typical 1.8 Vpp).

The drive voltage is amplified by 'A' and fed to two amplifiers 'B' and 'C', one is inverting and the other is a non inverting amplifier.
The outputs (pins 4 and 7) are connected to the series connection of the vertical deflection coil and feedback resistor.
The voltage across feed back resistor is fed via pin 9 to correction amplifier 'D', to obtain a deflection current which is proportional to the drive voltage.

The supply voltage for the TDA8356 is 16V at pin 3.
The flyback generator has a separate supply voltage of 45V on pin 6.

The guard pulse is useful to synchronize OSD.

Horizontal deflection

The circuit contains horizontal drive, line output transformer.
The horizontal driver pulses from the TDA8374 are amplified in the horizontal drive circuit, to get sufficient base-drive current for the high voltage switching transistor Q402.
During the horizontal scan period(=52 μs) Q402 will conduct, and a sawtooth current flows from +110/123V through the primary winding of the FBT to ground.
After this time Q402 is switched off and the energy stored in the FBT during the scan period will be transformed to the flyback capacitor C402.
This energy transfer will take place in a cosine shape because the primary of the FBT and C402 from a resonant circuit.
The time the energy is transferred from FBT to C402 and back to the FBT, is called the flyback time and will take place in about 12 μs.
The flyback peak voltage is about 8 times the scan voltage.

In series with the horizontal deflection coil there is a (damped) linearity corrector coil.
During the scan there is some loss in the resistance of the deflection coil.
In the first part of a line the linearity corrector stores some energy in a permanent magnet until it is saturated.
This improves the linearity of the horizontal scan speed.
The required S correction for the picture tube can be adjusted with the value of C404.
The beam current limiting information (BeamCurr) is derived from the foot of the H.V winding of the FBT.

This is connected via resistor to +8V.
As the beam current increase, the voltage on line Beam Current decreases.
Beam Curr. is damped by a integration filter before it is fed back to TDA8374 pin 22.
The TDA8374 will decrease the contrast (and eventually the brightness) to limit the average beam current.

Video amplifiers

Three TDA6106Q integrated video amplifiers drive cathode of the picture tube directly.
They are protected against CRT flashover discharges and ESD (electro static discharge).

The three video amplifiers, have a beam current output I black, used by the TDA8374 black current loop to control the black level on the cathodes.
The outputs can be connected together because the black current loop sequentially controls the black level for each cathode.

The amplification of the TDA6106Q is set by the resistors between pin 3 and 9 and between pin 3 (negative-input) and the TDA8374 output.
There are no alignment any more on the CPT panel, because of the automatic black current stabilization and because the white point adjustment can be done in the TDA8374 via I²C bus.

Power Supply STR-S5707

(1) VIN terminal, start-up circuit

A start-up circuit is to start and stop a operation of a control IC by detecting a voltage appearing at a VIN terminal (pin-9).
At start up of a power supply, when a voltage at the VIN terminal reaches to 8V (typical) by charging up C809 by the function of a start-up resistor, R803, a control circuit starts operating by the function of the start-up circuit.
After the control circuit starts its operation, power source is obtained by smoothing voltage appearing at winding of pin6-7 of T802.

(2) Oscillator, F/B terminal voltage (Pin 7)

A oscillator generates pulse signals which turns a power transistor on and off by making use of charge and discharge of C1 and C2 incorporated in the Hybrid IC.
Constant voltage control of a switch-mode power supply is performed by changing both ON-time and OFF-time except when the load is light (ex. remote control stand-by mode of TVs).
The ON-time is controlled by changing a current charged by C1, which is as the result of that the detection winding of pin5-7 of T802, which detects a change of voltage in a secondary side, connected to the sensing terminal (Pin 7) has the current in accordance with an output signal from an output voltage detection circuit (an error amplifier) built in.
As an AC input voltage to the power supply gets the higher and a load current the smaller, the current flowing to the SENS terminal gets the larger, and the ON-time gets the shorter.

(3) Function of INH terminal (Pin 6), control of OFF-time

Signal to the INH terminal is used as inputs to COMP.1 and COMP.2 inside of the control IC.
A threshold voltage of COMP.1, VTH1 is set at 0.75V (Ta=25°) and an input signal to a drive circuit becomes almost 0V (the power transistor is in OFF mode) when a voltage at the INH terminal reaches the VTH1.
A threshold voltage of COMP.2, VTH2, is set at 1.5V (Ta=25°).
When the INH terminal voltage reaches VTH2, an output from COMP.2 reverses (the power transistor is in on mode).

* Quasi-resonant operation

By inputting the voltage of winding of pin6-7 of T802 which is synchronized with the energy discharge time of a secondary winding, pin14(or 15)-16 of T802, to the INH terminal through D807 and R807, quasi-resonant operation can be achieved.
When the power transistor turns off and a voltage higher than VTH2 is applied to the INH terminal, C3 immediately discharges and then starts charging again.

Even after the discharge of energy of a secondary winding is completed, VINH does not immediately increases. When it gets lower than VTH1, the transistor turns on.

(4) Drive circuit

The STR-S5707 applies the proportional drive system in order to minimize turn-on and saturation loss, and storage time.

(5) OCP (over-current protection) function

Over-current protection is performed pulse by pulse by directly detecting collector current of the power transistor. Detecting voltage is set to -1V below a reference point of GND (ground).

(6) Latch circuit

It is a circuit which sustains an output from the oscillator low and stops operation of the power supply when over-voltage protection (OVP) circuit and thermal shutdown (TSD) circuit are in operation.
As the sustaining current of the latch circuit is 500 μA maximum when VIN terminal voltage is 4V, the power supply circuit sustains the off state as long as current of 500 μA minimum flows to V_{IN} terminal from a start-up resistor.
In order to prevent a malfunction to be caused by a noise and so on, delay time is provided by C1 incorporated in the IC and, therefore, the latch circuit operates when the OVP or TSD circuit is in operation, or an external signal input is provided for about 10 μsec or longer.
In addition, even after the latch circuit start operating, the constant voltage regulator (Reg) circuit is in operation and the circuit current is at high level.
As a result, V_{IN} terminal voltage rapidly decreases.
When VIN terminal voltage becomes lower than the shutdown voltage, $V_{IN(OFF)}$ (4.9V typical), it starts increasing as the circuit current is below 500μA.
When it reaches the ON-state voltage, $V_{IN(ON)}$ (8V typical), VIN terminal voltage starts decreasing because the circuit current increases again.
When the latch circuit is on, VIN terminal voltage increases and decreases within the range from 4.9V typical to 8V typical and is prevented from abnormally rising.
Cancellation of the latch is done by decreasing VIN terminal voltage below 3.3V.
The power supply can be restarted after disconnecting an AC input to the power supply once.

(7) Thermal shutdown circuit

It is a circuit to trigger the latch circuit when the frame temperature of the IC exceeds 150°C (typical).
Although the temperature is actually sensed at the control chip, it works against overheating of the power transistor as the power transistor and the control IC are mounted on the same lead frame.

(8) Over-voltage protection circuit

It is a circuit to trigger the latch circuit when VIN terminal voltage exceeds 11V (typical).
Although it basically functions as protection of VIN terminal against over-voltage, since VIN terminal is usually supplied from the drive winding of the transformer and the voltage is proportional to the output voltage, it also functions against the over-voltage of secondary output which causes when the control circuit opens or in some other events.

Stand - By Mode TOP210

This IC(TOP210) is used for low-power consumption when receiver is operating in stand-by mode.

(1) DRAIN PIN(Pin 5)

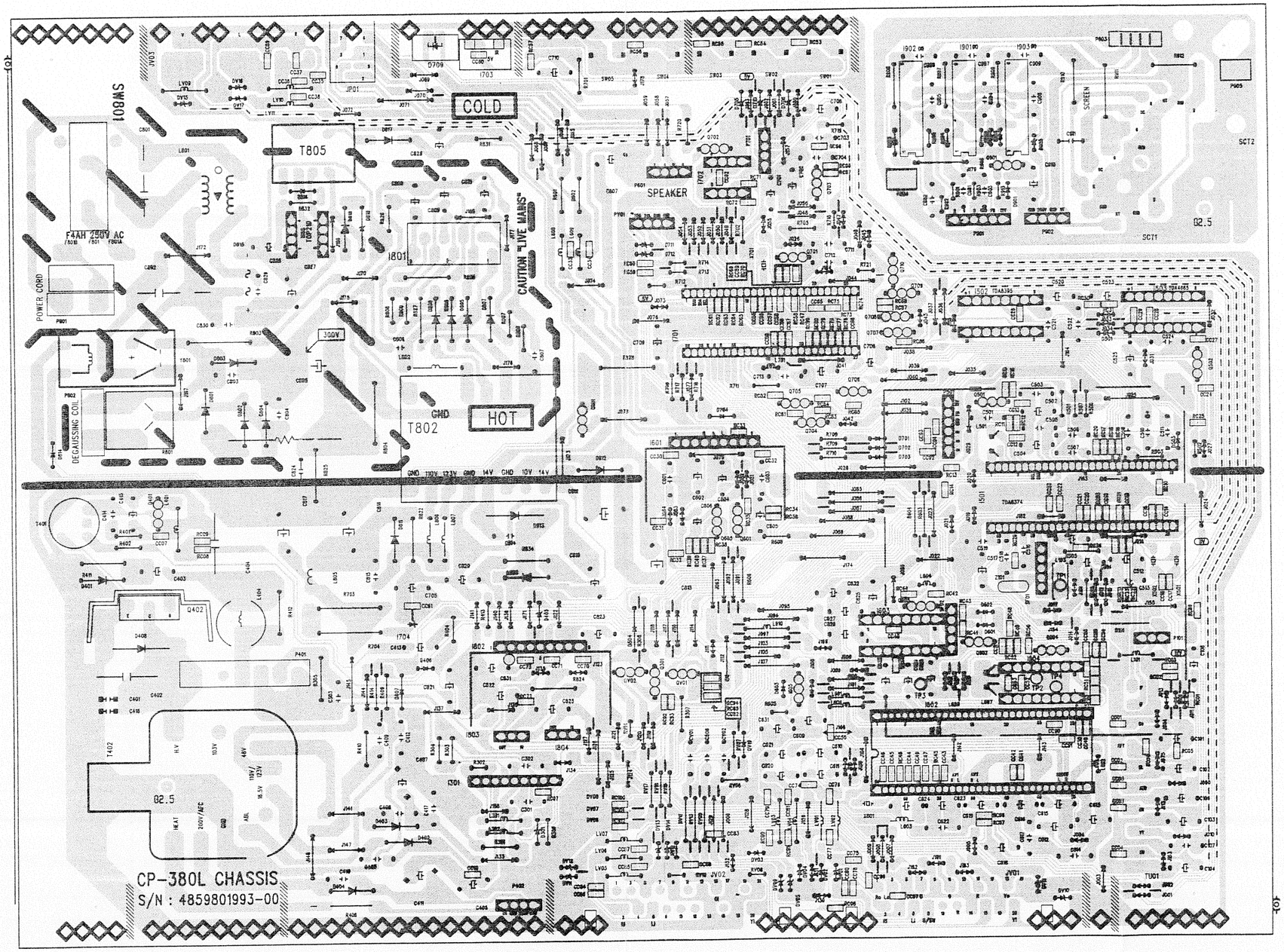
Output MOSFET drain connection. Provides internal bias current during start-up operation via an internal switched high voltage current source. Internal current sense point.

(2) CONTROL PIN(Pin 4)

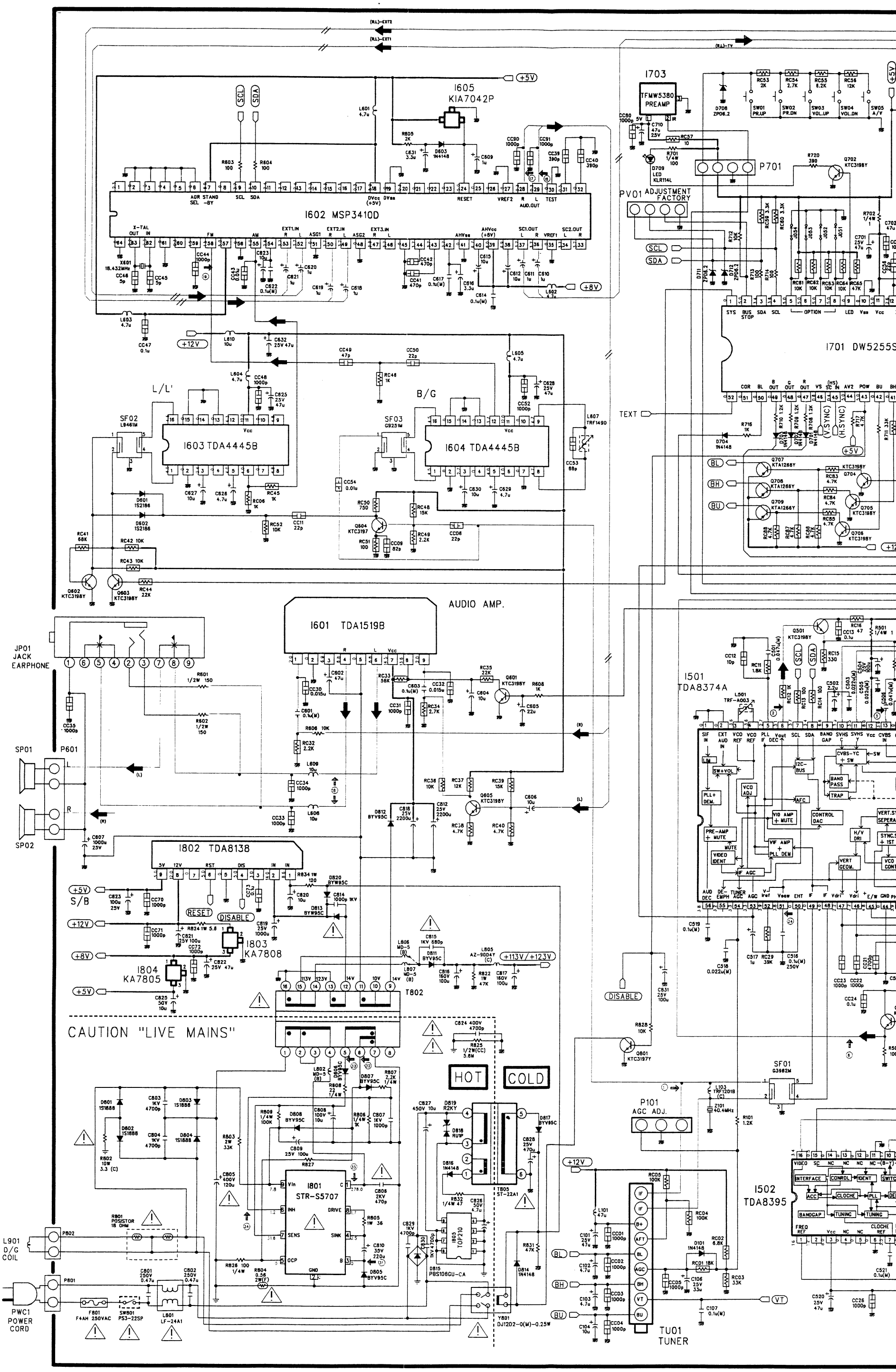
Error amplifier and feedback current input pin for duty cycle control. Internal shunt regulator connection to provide internal bias current during normal operation. It is also used as the supply bypass and auto-restart/compensation capacitor connection point.

PRINTED CIRCUIT BOARD

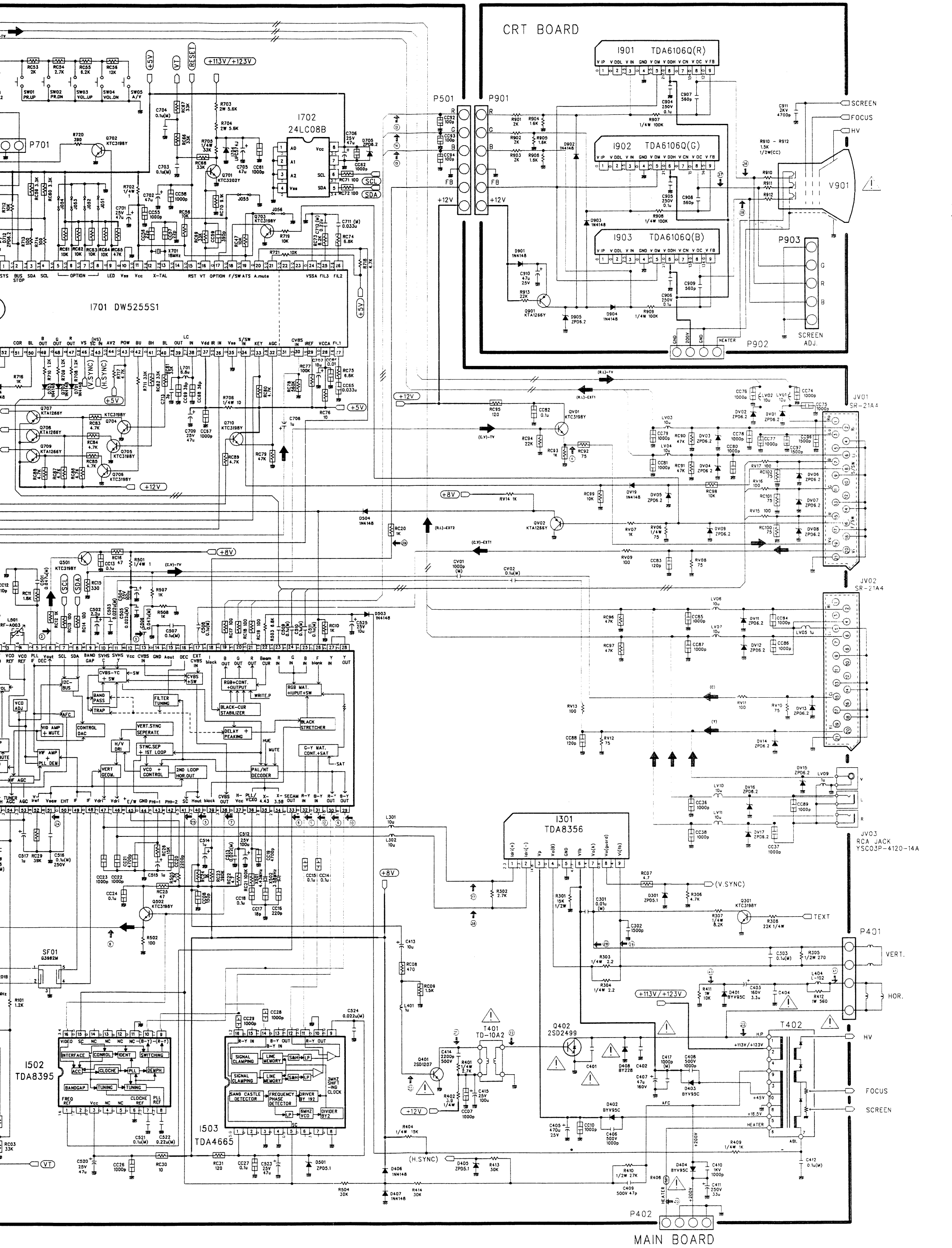
MAIN PCB



CP-380L CHASSIS SCHEMATIC DIAGRAM



DIAGRAM


CRT BOARD
I901 TDA6106Q(R)
I902 TDA6106Q(G)
I903 TDA6106Q(B)
P501
P901
P903
P902
P701
SCREEN
FOCUS
HV
V901
SCREEN ADJ.
I702 24LC08B
I701 DW5255S1
I502 TDA8395
I503 TDA4665
I301 TDA8356
JV01 SR-21A4
JV02 SR-21A4
JV03 RCA JACK YSC03P-4120-14A
P401
P402
T401 TD-10A2
T402
Q402 2SD2499
VERT.
HOR.
TEXT
MAIN BOARD

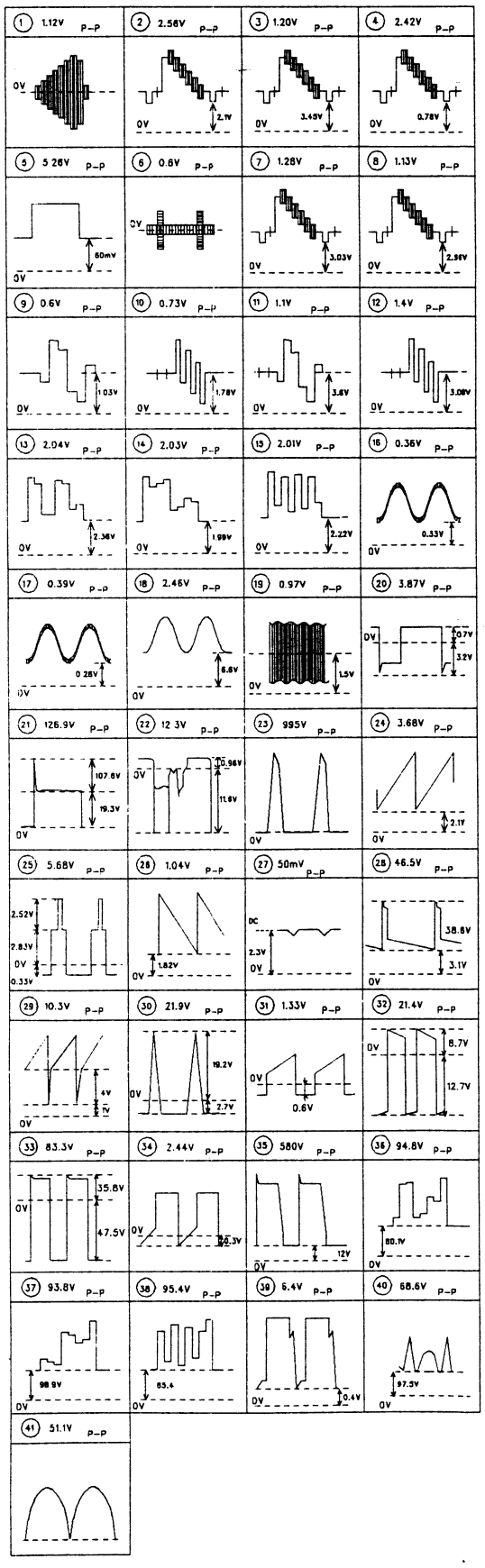
CHASSIS : CP-380L

SCHEMATIC DIAGRAM

* PAL - B/G
* PAL/SECAM - B/G, D/K
  NTSC - 3.58/4.43 (AV)
* PAL/SECAM - B/G, D/K
  SECAM - L
* PAL - I

WAVE FORMS

INPUT SIGNAL : PAL SYSTEM
VIDEO : 8 STEP COLOR BAR 87.5% AM
CONTROL ALL MAX MODE
AUDIO : 1KHz SINE WAVE 60% FM



NOTE:

1. RESISTANCE IS SHOWN IN OHM. K=1000, M=1000000
2. UNLESS OTHERWISE NOTED IN SCHEMATIC ALL CAPACITOR VALUES ARE EXPRESSED IN uF
3. VOLTAGES READ WITH "VTVM" FROM POINT INDICATED TO CHASSIS GROUND USING A COLOR BAR SIGNAL WITH ALL CONTROLS AT NORMAL LINE 230V AC VOLTAGE READINGS SHOWN ARE NORMAL VALUES AND MAY VARY +20% EXCEPT H.V
4. THIS CIRCUIT DIAGRAM IS A STANDARD ONE CIRCUIT PRINTED MAY BE SUBJECT TO CHANGE FOR PRODUCT IMPROVEMENT WITHOUT PRIOR NOTICE

WARNING:

BEFORE SERVICING THE CHASSIS, READ "X-RAY RADIATION", "SAFETY PRECAUTION", AND "PROCUCT SAFETY NOTICE" IN SERVICE MANUAL

CAUTION TO SERVICE TECHNICIANS:

BEFORE RETURNING THE RECEIVER TO CUSTOMER, LEAKAGE CURRENT OR RESISTANCE MEASUREMENTS SHOULD BE PREFORMED TO DERTERMINE THAT EXPOSED PARTS ARE PROPERLY INSULATED FROM THE SUPPLY CIRCUIT.

RESISTOR

CARBON FILM	
CARBON COMP	(CC)
FUSIBLE	(F)
CEMENT	(C)
CHIP	

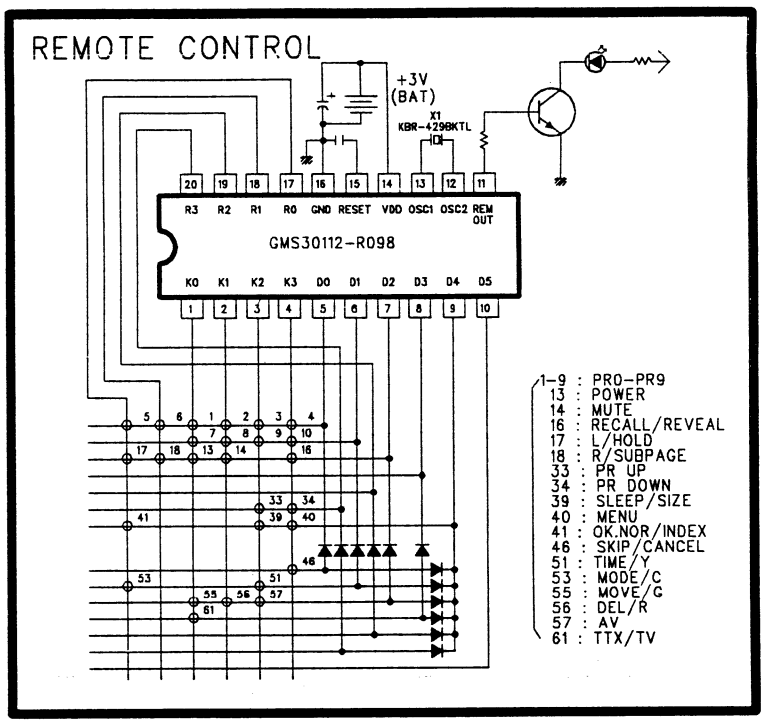
CAPACITOR

ELECTRO	
CERAMIC	
CERAMIC CH	(CH)
ELECTRO NONPOLAR	(NP)
MYLAR	(M)
CHIP	

COIL

PEAKING	
CHOKE	(C)
BEAD	(B)

REMOTE CONTROL



THE DIFFERENT PARTS OF SIZE

INCH	20"	21"		
CRT	OEC	OEC	PHILIPS	POLKOLOR
C401	2KV 470p	2KV 220p	2KV 470p	2KV 220p
C402	1.6KV 7500p (M)	1.6KV 6200p (M)	1.6KV 7500p (M)	1.6KV 6900p (M)
C404	200V 0.47u (M)	200V 0.3u (M)	200V 0.51u (M)	200V 0.27u (M)
L404	L-102	←	←	TRL-341G
L806	X	MD-5	X	←
L807	MD-5	X	MD-5	←
ZDC10	DC-2050	DC-2070	←	←
R302	2.2K	2.7K	3.3K	2.7K
R406	1W 2.4 (F) A	1W 1 (F) A	1W 2.7 (F) A	1W 1.2 (F) A
R827	1/4W 5.1K	1/4W 3.3K	1/4W 5.1K	←
SCT1	ISMM03S	←	X	X
SCT2	X	X	ISHS-09S	←
ZCG10	2001H-1015-1P	2101H-1015-1P	←	←
V901	A48JLL90X02	A51JSW90X02	A51EAL55X01	A51EBV13X09
P401A	X	X	DY CONN.	←

THE DIFFERENT PARTS OF SYSTEM

MODEL		LF	LK	LU	LA
SYSTEM		PAL - B/G	P/S - B/G - D/K	PAL -I	P/S - B/G SECAM-L/L'
1	J051	X	←	JUMPER	X
2	J052	JUMPER	X	←	←
3	J054	X	JUMPER	X	←
4	J055	X	←	←	JUMPER
5	C805	400V 120uF	450V 150uF	400V 120uF	←
6	D601	X	←	←	1S2186
7	D602	X	←	←	1S2186
8	I501	TDA8374A	←	←	TDA8374
9	I502	X	TDA8395	X	TDA8395
10	I603	X	←	←	TDA4445B
11	PWC1	CW-4232	KKP-419C	CW-3222	CW-4232
12	SF01	G3962M	K3953M	←	G3962M
13	SF02	X	←	←	L 9461-M
14	SF03	G9251M	K9260M	←	G9251M
15	TU01	3303KHC	←	3303UEC	3303KHC
16	Z101	T40MA	X	T40MA	←

PRODUCT SAFETY NOTE :

THE COMPONENTS MARKED WITH ⚠ ARE IMPORTANT FOR MAINTAINING THE SAFETY OF THE SET AND SHOULD BE REPLACED ONLY WITH TYPES IDENTICAL TO THOSE IN THE ORIGINAL OR SPECIFIED ONE IN THE PART LIST. DON'T DEGRADE THE SAFETY OF THE SET THROUGH IMPROPER SERVICING.

■ Electrical Parts List

⚠ **Components marked with this symbol must only be replaced by a component having identical physical characteristics.**

MODEL : DTT-21T2LF

LOC.	PART-CODE	PART-NAME	PART-TYPE	REMARK
ZAC10	PSACPW0034	ACCESSORY AS	DTT-21T2TF	
M822	4858211400	POLY BAG	P.E FILM T0.03X600X550	
30	47P7500001	BATTERY	AAM 1.5V	
40	4850A03310	ANT ROD	PH-RM-008A	
10000	48586A1617	MANUAL INSTRUCTION	ALL	
ZBC10	PSBCSH0034	COVER BACK AS	DTT-21T2TF	
M211	4852147501	COVER BACK	HIPS BK	
M541	4855415800	SPEC PLATE	150ART P/E FILM (C/TV)	
M781	4857817610	CLOTH BLACK	FELT T0.7 L=300	
ZCA10	PSCACA0113	CABINET AS	DTT-21T2LF	
M191	4851926601	BUTTON CTRL AS	21T2	
M211A	7122401412	SCREW TAPPING	T2S TRS 4X14 MFZN BK	
M211B	7122401412	SCREW TAPPING	T2S TRS 4X14 MFZN BK	
M481	4854848401	BUTTON POWER	ABS BK	
M481A	4856716000	SPRING	SWPA PIE0.5	
M561	4855615900	MARK BRAND	A1050P-H24 T0.4	
M681	4856812001	TIE CABLE	NYLON66 DA100	
SP01B	7128301011	SCREW TAPPING	T2S WAS 3X10 MFZN	
SP02B	7128301011	SCREW TAPPING	T2S WAS 3X10 MFZN	
V901	PSRTPWU004	CRT AS	C004	
V01	58D0000063	COIL DY	ODY-F2102	
V02	48A96R004-	RUBBER WEDGE	HMR 28 SR (10X54)	
V03	4850PM001-	MAGNET CP	NY-225 (MINI NECK)	
V04	2TG00025—	TAPE GLASS	W25	
V05	2224050025	BOND SILICON	RTV 122 TUBE	
V901	48A96321P1	CRT BARE	A51JSW90X	⚠
V901A	4856214900	WASHER RUBBER	TMR-CA	
V901B	4856013301	SCREW CRT FIXING AS	30X140 YL	
V901C	4856013303	SCREW CRT FIXING AS	30X250 YL	
ZFM10	PSFMSJ0034	MASK FRONT AS	DTT-21T2TF	
M201	4852060901	MASK FRONT	HIPS BK	
ZMP10	PSMPMS0113	PCB MAIN MANUAL AS	DTT-21T2LF	
10	2193102005	SOLDER BAR	SN:PB=63:47 S63S-1320	
20	2193011101	SOLDER WIRE	RS 60-1.2 1.6A	
30	2291050615	FLUX SOLDER	DF-2012U	
40	2291050301	FLUX SOLVENT	IM-1000	
60	2224050026	BOND SILICON	RTV 122 CARTRIDGE	
90	2291051001	FLUX KILLER	KFT-7	
100	2291140501	WAX COVER		
C402	CMYH3C622J	C MYLAR	1.6KV BUP 6200PF J	⚠
C404	CMYE2D304J	C MYLAR	200V PU 0.3MF J	⚠

LOC.	PART-CODE	PART-NAME	PART-TYPE	REMARK
C801	CL1JB3474K	C LINE ACROSS	AC250V 0.47MF U/C/SNDF/SV	
C802	CL1JB3474K	C LINE ACROSS	AC250V 0.47MF U/C/SNDF/SV	
C805	CEYM2G121T	C ELECTRO	400V LWF 120MF (25X50)	⚠
C814	CCXR3A102K	C CERA	HIKR 1KV 1000PF K 125C	
C815	CCXB2H561K	C CERA	500V B 560PF K (TAPPING)	⚠
C824	CH1FFE472M	C CERA AC	4.0KV 4700PF M KD AC250V	
C911	CCYB3D472K	C CERA	2KV B 4700PF K	
D408	DBY228——	DIODE	BY228 (TAPPING)	⚠
D709	DKLR114L—	LED	KLR114L	
D813	DBYW95C—	DIODE	BYW95C (TAPPING)	⚠
D815	DPBS106GU-	DIODE	PBS106GU-CA	
F801	5FSCB4022R	FUSE CERA	SEMKO F4AH 4A 250V MF51	⚠
I301	1TDA8356—	IC VERTICAL	TDA8356	
I301A	4857024617	HEAT SINK	AL EX	
I301B	7174301011	SCREW TAPPTITE	TT2 RND 3X10 MFZN	
I501	1TDA8374A-	IC VCD	TDA8374A	
I503	1TDA4665V4	IC DELAY	TDA4665/V4	
I601	1TDA1519B-	IC AMP	TDA1519B	
I601A	4857025401	HEAT SINK	A1050P-H24 T2	
I601B	7174300811	SCREW TAPPTITE	TT2 RND 3X8 MFZN	
I602	1MSP3410D-	IC AUDIO	MSP3410D	
I604	1TDA4445B-	IC	TDA4445B	
I701	1DW5255S1-	IC MICOM	DW5255S1	
I702	124LC08B—	IC MEMORY	24LC08B	
I703	1TFMW5380-	IC PREAMP	TFMW5380	
I704	1UPC574J—	IC	UPC574J	
I801	1STRS5707-	IC POWER	STR-S5707	⚠
I802	1TDA8138—	IC REGULATOR	TDA8138	
I802A	4857025401	HEAT SINK	A1050P-H24 T2	
I802B	7174300811	SCREW TAPPTITE	TT2 RND 3X8 MFZN	
I803	1KA7808—	IC REGULATOR	KA7808	
I803A	4857026900	HEAT SINK	AL EX	
I803B	7174300811	SCREW TAPPTITE	TT2 RND 3X8 MFZN	
I804	1KA7805—	IC REGULATOR	KA7805	
I805	1T0P210—	IC STAND BY	TOP210	
I901	1TDA6106Q-	IC AMP	TDA6106Q	
I902	1TDA6106Q-	IC AMP	TDA6106Q	
I903	1TDA6106Q-	IC AMP	TDA6106Q	
JP01	4859102130	JACK EARPHONE	YSC-1537	
JV01	4859200401	SOCKET RGB	SR-21A1 (ANGLE TYPE)	
JV02	4859200401	SOCKET RGB	SR-21A1 (ANGLE TYPE)	
JV03	4859108450	JACK PIN BOARD	YSC03P-4120-14A	
L103	58C9780027	COIL CHOKE	TRF-1201B (0.97 UH)	
L404	58H0000016	COIL H-LINEARITY	L-102 (102UH)	
L501	58E0000S39	COIL AFT	TRF-A003	

LOC.	PART-CODE	PART-NAME	PART-TYPE	REMARK
L607	58M38R9006	COIL DET	TRF-1490	
L801	5PLF24A1—	FILTER LINE	LF-24A1	⚠
L805	58C9430599	COIL CHOKE	AZ-9004Y(94MH)	
M351	4853530901	HOLDER LED	HIPS BK	
M721	4857235402	SHIELD CASE	SPTH-C T0.25	
PWC1	4859903110	CORD POWER AS	CW4232+BL102NG+TUBE=2500	
A000	4859903511	CORD POWER	CW4232 H03VVH2-F=2250	
P401	4859240120	CONN WAFER	YFW500-06	
P801	4859242220	CONN WAFER	YFW800-02	
P802	4859242220	CONN WAFER	YFW800-02	
P901	4850706S02	CONN AS	YH025-06+YST025+ULW=400	
P902	4850704S04	CONN AS	YH025-04+YST025+ULW=400	
P903	4859275220	CONN WAFER	YF254-05R (ANGLE)	
P904	4859262120	CONN WAFER	YFW800-01	
Q402	T2SD2499—	TR	2SD2499	⚠
R406	RF01Y109JA	R FUSIBLE	1W 1 OHM J A CURVE	⚠
R801	DEC180M290	POSISTOR	ECPCC180M290	⚠
R802	RX10B339JN	R CEMENT	10W 3.3 OHM J BENCH 4P	⚠
SCT1	4859303030	SOCKET CRT	ISMM03S	⚠
SF01	5PG3962M—	FILTER SAW	G 3962-M	
SF03	5PG9251M—	FILTER SAW	G 9251-M	
SW801	5S40101143	SW PUSH	PS3-22SP (P.C.B)	⚠
TU01	4859714430	TUNER VARACTOR	3303KHC-3X1289	
T401	50D10A2—	TRANS DRIVE	TD-10A2	⚠
T402	50H0000177	FBT	HST1142.5057	⚠
T802	50M0000099	TRANS SMPS	SMT2084.0014D	⚠
T805	50MST22A1-	TRANS SMPS	ST-22A1	
X501	5XE4R4336E	CRYSTAL QUARTZ	HC-49/U 4.433619MHZ 30PPM	
X502	5XE3R5795E	CRYSTAL QUARTZ	HC-49/U 3.579545MHZ 30PPM	
X601	5XE18R432E	CRYSTAL QUARTZ	HC-49/U 18.43200MHZ 30PPM	
X701	5XE18R000E	CRYSTAL QUARTZ	HC-49/U 18.000MHZ 30PPM	
Y801	5SC0201335	SW RELAY	DJ12D2-0(M)-0.25W	
ZMP10	PSMPJ20113	PCB CHIP MOUNT B AS	DTT-21T2LF	
CC01	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC02	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC03	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC04	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC05	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC06	HCQK220JCA	C CHIP CERA	50V CH 22PF J 2012	
CC07	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC08	HCQK151JCA	C CHIP CERA	50V CH 150PF J 2012	
CC09	HCQK820JCA	C CHIP CERA	50V CH 82PF J 2012	
CC10	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC11	HCQK220JCA	C CHIP CERA	50V CH 22PF J 2012	
CC12	HCQK100DCA	C CHIP CERA	50V CH 10PF D 2012	

LOC.	PART-CODE	PART-NAME	PART-TYPE	REMARK
CC13	HCFK104ZCA	C CHIP CERA	50V Y5V 0.1MF Z 2012	
CC14	HCFK104ZCA	C CHIP CERA	50V Y5V 0.1MF Z 2012	
CC15	HCFK104ZCA	C CHIP CERA	50V Y5V 0.1MF Z 2012	
CC16	HCQK221JCA	C CHIP CERA	50V CH 220PF J 2012	
CC17	HCQK180JCA	C CHIP CERA	50V CH 18PF J 2012	
CC18	HCFK104ZCA	C CHIP CERA	50V Y5V 0.1MF Z 2012	
CC19	HCBK472KCA	C CHIP CERA	50V X7R 4700PF K 2012	
CC20	HCBK222KCA	C CHIP CERA	50V X7R 2200PF K 2012	
CC21	HCBK472KCA	C CHIP CERA	50V X7R 4700PF K 2012	
CC22	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC23	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC24	HCFK104ZCA	C CHIP CERA	50V Y5V 0.1MF Z 2012	
CC26	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC27	HCFK104ZCA	C CHIP CERA	50V Y5V 0.1MF Z 2012	
CC28	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC29	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC30	HCBK153KCA	C CHIP CERA	50V X7R 0.015MF K 2012	
CC31	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC32	HCBK153KCA	C CHIP CERA	50V X7R 0.015MF K 2012	
CC33	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC34	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC35	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC36	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC37	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC38	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC39	HCQK391JCA	C CHIP CERA	50V CH 390PF J 2012	
CC40	HCQK391JCA	C CHIP CERA	50V CH 390PF J 2012	
CC41	HCQK471JCA	C CHIP CERA	50V CH 470PF J 2012	
CC42	HCQK471JCA	C CHIP CERA	50V CH 470PF J 2012	
CC43	HCFK103ZCA	C CHIP CERA	50V Y5V 0.01MF Z 2012	
CC44	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC45	HCQK509DCA	C CHIP CERA	50V CH 5PF D 2012	
CC46	HCQK509DCA	C CHIP CERA	50V CH 5PF D 2012	
CC47	HCFK104ZCA	C CHIP CERA	50V Y5V 0.1MF Z 2012	
CC48	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC49	HCQK470JCA	C CHIP CERA	50V CH 47PF J 2012	
CC50	HCQK220JCA	C CHIP CERA	50V CH 22PF J 2012	
CC52	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC53	HCQK680JCA	C CHIP CERA	50V CH 68PF J 2012	
CC54	HCFK103ZCA	C CHIP CERA	50V Y5V 0.01MF Z 2012	
CC55	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC56	HCQK220JCA	C CHIP CERA	50V CH 22PF J 2012	
CC57	HCQK220JCA	C CHIP CERA	50V CH 22PF J 2012	
CC58	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC59	HCQK391JCA	C CHIP CERA	50V CH 390PF J 2012	

LOC.	PART-CODE	PART-NAME	PART-TYPE	REMARK
CC60	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC61	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC62	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC65	HCBK333KCA	C CHIP CERA	50V X7R 0.033MF K 2012	
CC66	HCFK103ZCA	C CHIP CERA	50V Y5V 0.01MF Z 2012	
CC67	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC68	HCQK360JCA	C CHIP CERA	50V CH 36PF J 2012	
CC69	HCQK390JCA	C CHIP CERA	50V CH 39PF J 2012	
CC70	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC71	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC72	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC73	HCFK104ZCA	C CHIP CERA	50V Y5V 0.1MF Z 2012	
CC74	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC75	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC76	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC77	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC78	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC79	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC80	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC81	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC82	HCFK104ZCA	C CHIP CERA	50V Y5V 0.1MF Z 2012	
CC83	HCQK121JCA	C CHIP CERA	50V CH 120PF J 2012	
CC84	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC85	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC86	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC87	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC88	HCQK121JCA	C CHIP CERA	50V CH 120PF J 2012	
CC89	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC90	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC91	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	
CC92	HCQK101JCA	C CHIP CERA	50V CH 100PF J 2012	
CC93	HCQK101JCA	C CHIP CERA	50V CH 100PF J 2012	
CC94	HCQK101JCA	C CHIP CERA	50V CH 100PF J 2012	
CC96	HCBK152KCA	C CHIP CERA	50V X7R 1500PF K 2012	
CC97	HCBK152KCA	C CHIP CERA	50V X7R 1500PF K 2012	
RC01	HRFT183JCA	R CHIP	1/10 18K OHM J 2012	
RC02	HRFT682JCA	R CHIP	1/10 6.8K OHM J 2012	
RC03	HRFT333JCA	R CHIP	1/10 33K OHM J 2012	
RC04	HRFT104JCA	R CHIP	1/10 100K OHM J 2012	
RC05	HRFT104JCA	R CHIP	1/10 100K OHM J 2012	
RC06	HRFT102JCA	R CHIP	1/10 1K OHM J 2012	
RC07	HRFT479JCA	R CHIP	1/10 4.7 OHM J 2012	
RC08	HRFT471JCA	R CHIP	1/10 470 OHM J 2012	
RC09	HRFT152JCA	R CHIP	1/10 1.5K OHM J 2012	
RC10	HRFT102JCA	R CHIP	1/10 1K OHM J 2012	

LOC.	PART-CODE	PART-NAME	PART-TYPE	REMARK
RC11	HRFT182JCA	R CHIP	1/10 1.8K OHM J 2012	
RC12	HRFT102JCA	R CHIP	1/10 1K OHM J 2012	
RC13	HRFT101JCA	R CHIP	1/10 100 OHM J 2012	
RC14	HRFT101JCA	R CHIP	1/10 100 OHM J 2012	
RC15	HRFT331JCA	R CHIP	1/10 330 OHM J 2012	
RC16	HRFT470JCA	R CHIP	1/10 47 OHM J 2012	
RC17	HRFT101JCA	R CHIP	1/10 100 OHM J 2012	
RC18	HRFT101JCA	R CHIP	1/10 100 OHM J 2012	
RC19	HRFT101JCA	R CHIP	1/10 100 OHM J 2012	
RC20	HRFT102JCA	R CHIP	1/10 1K OHM J 2012	
RC21	HRFT104JCA	R CHIP	1/10 100K OHM J 2012	
RC22	HRFT479JCA	R CHIP	1/10 4.7 OHM J 2012	
RC23	HRFT394JCA	R CHIP	1/10 390K OHM J 2012	
RC24	HRFT102JCA	R CHIP	1/10 1K OHM J 2012	
RC25	HRFT470JCA	R CHIP	1/10 47 OHM J 2012	
RC26	HRFT153JCA	R CHIP	1/10 15K OHM J 2012	
RC29	HRFT393JCA	R CHIP	1/10 39K OHM J 2012	
RC30	HRFT100JCA	R CHIP	1/10 10 OHM J 2012	
RC31	HRFT121JCA	R CHIP	1/10 120 OHM J 2012	
RC32	HRFT222JCA	R CHIP	1/10 2.2K OHM J 2012	
RC33	HRFT563JCA	R CHIP	1/10 56K OHM J 2012	
RC34	HRFT272JCA	R CHIP	1/10 2.7K OHM J 2012	
RC35	HRFT223JCA	R CHIP	1/10 22K OHM J 2012	
RC36	HRFT103JCA	R CHIP	1/10 10K OHM J 2012	
RC37	HRFT123JCA	R CHIP	1/10 12K OHM J 2012	
RC38	HRFT472JCA	R CHIP	1/10 4.7K OHM J 2012	
RC39	HRFT153JCA	R CHIP	1/10 15K OHM J 2012	
RC40	HRFT472JCA	R CHIP	1/10 4.7K OHM J 2012	
RC41	HRFT683JCA	R CHIP	1/10 68K OHM J 2012	
RC42	HRFT103JCA	R CHIP	1/10 10K OHM J 2012	
RC43	HRFT103JCA	R CHIP	1/10 10K OHM J 2012	
RC44	HRFT223JCA	R CHIP	1/10 22K OHM J 2012	
RC45	HRFT102JCA	R CHIP	1/10 1K OHM J 2012	
RC46	HRFT102JCA	R CHIP	1/10 1K OHM J 2012	
RC47	HRFT103JCA	R CHIP	1/10 10K OHM J 2012	
RC48	HRFT153JCA	R CHIP	1/10 15K OHM J 2012	
RC49	HRFT222JCA	R CHIP	1/10 2.2K OHM J 2012	
RC50	HRFT751JCA	R CHIP	1/10 750 OHM J 2012	
RC51	HRFT101JCA	R CHIP	1/10 100 OHM J 2012	
RC52	HRFT103JCA	R CHIP	1/10 10K OHM J 2012	
RC53	HRFT202JCA	R CHIP	1/10 2K OHM J 2012	
RC54	HRFT272JCA	R CHIP	1/10 2.7K OHM J 2012	
RC55	HRFT622JCA	R CHIP	1/10 6.2K OHM J 2012	
RC56	HRFT123JCA	R CHIP	1/10 12K OHM J 2012	
RC57	HRFT100JCA	R CHIP	1/10 10 OHM J 2012	

LOC.	PART-CODE	PART-NAME	PART-TYPE	REMARK
RC58	HRFT103JCA	R CHIP	1/10 10K OHM J 2012	
RC59	HRFT332JCA	R CHIP	1/10 3.3K OHM J 2012	
RC60	HRFT332JCA	R CHIP	1/10 3.3K OHM J 2012	
RC61	HRFT103JCA	R CHIP	1/10 10K OHM J 2012	
RC62	HRFT103JCA	R CHIP	1/10 10K OHM J 2012	
RC63	HRFT103JCA	R CHIP	1/10 10K OHM J 2012	
RC64	HRFT103JCA	R CHIP	1/10 10K OHM J 2012	
RC65	HRFT473JCA	R CHIP	1/10 47K OHM J 2012	
RC66	HRFT333JCA	R CHIP	1/10 33K OHM J 2012	
RC67	HRFT333JCA	R CHIP	1/10 33K OHM J 2012	
RC68	HRFT333JCA	R CHIP	1/10 33K OHM J 2012	
RC69	HRFT333JCA	R CHIP	1/10 33K OHM J 2012	
RC70	HRFT912JCA	R CHIP	1/10 9.1K OHM J 2012	
RC71	HRFT101JCA	R CHIP	1/10 100 OHM J 2012	
RC72	HRFT101JCA	R CHIP	1/10 100 OHM J 2012	
RC73	HRFT822JCA	R CHIP	1/10 8.2K OHM J 2012	
RC74	HRFT682JCA	R CHIP	1/10 6.8K OHM J 2012	
RC75	HRFT682JCA	R CHIP	1/10 6.8K OHM J 2012	
RC76	HRFT100JCA	R CHIP	1/10 10 OHM J 2012	
RC77	HRFT913JCA	R CHIP	1/10 91K OHM J 2012	
RC78	HRFT564JCA	R CHIP	1/10 560K OHM J 2012	
RC79	HRFT473JCA	R CHIP	1/10 47K OHM J 2012	
RC80	HRFT472JCA	R CHIP	1/10 4.7K OHM J 2012	
RC81	HRFT333JCA	R CHIP	1/10 33K OHM J 2012	
RC82	HRFT333JCA	R CHIP	1/10 33K OHM J 2012	
RC83	HRFT472JCA	R CHIP	1/10 4.7K OHM J 2012	
RC84	HRFT472JCA	R CHIP	1/10 4.7K OHM J 2012	
RC85	HRFT472JCA	R CHIP	1/10 4.7K OHM J 2012	
RC86	HRFT472JCA	R CHIP	1/10 4.7K OHM J 2012	
RC87	HRFT472JCA	R CHIP	1/10 4.7K OHM J 2012	
RC88	HRFT472JCA	R CHIP	1/10 4.7K OHM J 2012	
RC89	HRFT472JCA	R CHIP	1/10 4.7K OHM J 2012	
RC90	HRFT473JCA	R CHIP	1/10 47K OHM J 2012	
RC91	HRFT473JCA	R CHIP	1/10 47K OHM J 2012	
RC92	HRFT750JCA	R CHIP	1/10 75 OHM J 2012	
RC93	HRFT102JCA	R CHIP	1/10 1K OHM J 2012	
RC94	HRFT223JCA	R CHIP	1/10 22K OHM J 2012	
RC95	HRFT121JCA	R CHIP	1/10 120 OHM J 2012	
RC96	HRFT473JCA	R CHIP	1/10 47K OHM J 2012	
RC97	HRFT473JCA	R CHIP	1/10 47K OHM J 2012	
RC98	HRFT103JCA	R CHIP	1/10 10K OHM J 2012	
RC99	HRFT103JCA	R CHIP	1/10 10K OHM J 2012	
RC100	HRFT750JCA	R CHIP	1/10 75 OHM J 2012	
RC101	HRFT750JCA	R CHIP	1/10 75 OHM J 2012	
RC102	HRFT750JCA	R CHIP	1/10 75 OHM J 2012	

LOC.	PART-CODE	PART-NAME	PART-TYPE	REMARK
ZMP10	PSMPJ00113	PCB MAIN (RHU) AS	DTT-21T2LF	
C401	CCXB3D221K	C CERA	2KV B 220PF K (TAPPING)	⚠
C403	CEXF2C339V	C ELECTRO	160V RSS 3.3MF (8X16) TP	
C405	CEXF1E471V	C ELECTRO	25V RSS 470MF (10X16) TP	
C407	CEXF2C470V	C ELECTRO	160V RSS 47MF (13X25) TP	
C411	CEXF2E330V	C ELECTRO	250V RSS 33MF (13X25) TP	
C607	CEXF1E102V	C ELECTRO	25V RSS 1000MF (13X20) TP	
C806	CCXB3D471K	C CERA	2KV B 470PF K (TAPPING)	⚠
C810	CEXF1V221V	C ELECTRO	35V RSS 220MF (10X12.5) TP	
C812	CEXF1E222V	C ELECTRO	25V RSS 2200MF (16X25) TP	
C816	CEXF2C101C	C ELECTRO	160V RUS 100MF (16X25) TP	
C817	CEXF2C101C	C ELECTRO	160V RUS 100MF (16X25) TP	
C818	CEXF1E222V	C ELECTRO	25V RSS 2200MF (16X25) TP	
C819	CEXF1E102V	C ELECTRO	25V RSS 1000MF (13X20) TP	
C827	CEXF2W100V	C ELECTRO	450V RSS 10MF (13X20) TP	
C828	CEXF1E471V	C ELECTRO	25V RSS 470MF (10X16) TP	
ZMP10	PSMPJB0113	PCB MAIN M-10 AS	DTT-21T2LF	
D818	DRU1P——	DIODE	RU 1P (TAPPING)	
D819	DR2KY——	DIODE AVALANCHE	R 2-KY (TAPPING)	
P101	485923162S	CONN WAFER	YW025-03 (STICK)	
P402	485923172S	CONN WAFER	YW025-04 (STICK)	
P501	485923192S	CONN WAFER	YW025-06 (STICK)	
P601	485923172S	CONN WAFER	YW025-04 (STICK)	
R411	RS01Z103J-	R M-OXIDE FILM	1W 10K OHM J (TAPPING)	
R412	RS01Z561J-	R M-OXIDE FILM	1W 560 OHM J (TAPPING)	
R703	RS02Z562J-	R M-OXIDE FILM	2W 5.6K OHM J (TAPPING)	
R704	RS02Z562J-	R M-OXIDE FILM	2W 5.6K OHM J (TAPPING)	
R803	RS02Z333J-	R M-OXIDE FILM	2W 33K OHM J	
R804	RF02Z568J-	R FUSIBLE	2W 0.56 OHM J (TAPPING)	⚠
R805	RS01Z240J-	R M-OXIDE FILM	1W 24 OHM J (TAPPING)	
R822	RS01Z473J-	R M-OXIDE FILM	1W 47K OHM J (TAPPING)	
R824	RS01Z569J-	R M-OXIDE FILM	1W 5.6 OHM J (TAPPING)	
R834	RS01Z121J-	R M-OXIDE FILM	1W 120 OHM J (TAPPING)	
ZMP10	PSMPJR0113	PCB MAIN RADIAL AS	DTT-21T2LF	
CV01	CMXM2A102J	C MYLAR	100V 1000PF J (TP)	
CV02	CMXM2A104J	C MYLAR	100V 0.1MF J (TP)	
C101	CEXF1E470V	C ELECTRO	25V RSS 47MF (5X11) TP	
C102	CEXF1H479V	C ELECTRO	50V RSS 4.7MF (5X11) TP	
C103	CEXF1H479V	C ELECTRO	50V RSS 4.7MF (5X11) TP	
C104	CEXF1H100V	C ELECTRO	50V RSS 10MF (5X11) TP	
C106	CEXF1E330V	C ELECTRO	25V RSS 33MF (5X11) TP	
C107	CMXM2A104J	C MYLAR	100V 0.1MF J (TP)	
C301	CMXM2A103J	C MYLAR	100V 0.01MF J (TP)	
C302	CCXB1H152K	C CERA	50V B 1500PF K (TAPPING)	
C303	CMXM2A104J	C MYLAR	100V 0.1MF J (TP)	

LOC.	PART-CODE	PART-NAME	PART-TYPE	REMARK
C406	CCXB2H102K	C CERA	500V B 1000PF K (TAPPING)	
C408	CCXB2H102K	C CERA	500V B 1000PF K (TAPPING)	
C409	CXSL2H470J	C CERA	500V SL 47PF J (TAPPING)	
C410	CCXB3A102K	C CERA	1KV B 1000PF K (TAPPING)	
C412	CMXM2A104J	C MYLAR	100V 0.1MF J (TP)	
C413	CEXF1H100V	C ELECTRO	50V RSS 10MF (5X11) TP	
C414	CCXB2H222K	C CERA	500V B 2200PF K (TAPPING)	
C415	CEXF1E101V	C ELECTRO	25V RSS 100MF (6.3X11) TP	
C417	CMXM2A102J	C MYLAR	100V 1000PF J (TP)	
C501	CMXM2A473J	C MYLAR	100V 0.047MF J (TP)	
C502	CEXF1H229V	C ELECTRO	50V RSS 2.2MF (5X11) TP	
C503	CMXM2A223J	C MYLAR	100V 0.022MF J TP	
C504	CEXF1E101V	C ELECTRO	25V RSS 100MF (6.3X11) TP	
C505	CMXM2A223J	C MYLAR	100V 0.022MF J TP	
C506	CMXM2A473J	C MYLAR	100V 0.047MF J (TP)	
C507	CMXM2A104J	C MYLAR	100V 0.1MF J (TP)	
C508	CMXM2A104J	C MYLAR	100V 0.1MF J (TP)	
C509	CMXM2A104J	C MYLAR	100V 0.1MF J (TP)	
C510	CMXM2A104J	C MYLAR	100V 0.1MF J (TP)	
C511	CMXM2A104J	C MYLAR	100V 0.1MF J (TP)	
C512	CEXF1E101V	C ELECTRO	25V RSS 100MF (6.3X11) TP	
C513	CMXM2A223J	C MYLAR	100V 0.022MF J TP	
C514	CEXF1H109V	C ELECTRO	50V RSS 1MF (5X11) TP	
C515	CEXF1H109V	C ELECTRO	50V RSS 1MF (5X11) TP	
C516	CMXL2E104K	C MYLAR	250V MEU 0.1MF K	
C517	CEXF1H109V	C ELECTRO	50V RSS 1MF (5X11) TP	
C518	CMXM2A223J	C MYLAR	100V 0.022MF J TP	
C519	CMXM2A104J	C MYLAR	100V 0.1MF J (TP)	
C520	CEXF1E470V	C ELECTRO	25V RSS 47MF (5X11) TP	
C521	CMXM2A104J	C MYLAR	100V 0.1MF J (TP)	
C522	CMXB1H224J	C MYLAR	50V EU 0.22MF J (TP)	
C523	CEXF1E470V	C ELECTRO	25V RSS 47MF (5X11) TP	
C524	CMXM2A223J	C MYLAR	100V 0.022MF J TP	
C525	CEXF1H100V	C ELECTRO	50V RSS 10MF (5X11) TP	
C601	CMXM2A104J	C MYLAR	100V 0.1MF J (TP)	
C602	CEXF1H470V	C ELECTRO	50V RSS 47MF (6.3X11) TP	
C603	CMXM2A104J	C MYLAR	100V 0.1MF J (TP)	
C604	CEXF1H100V	C ELECTRO	50V RSS 10MF (5X11) TP	
C605	CEXF1H220V	C ELECTRO	50V RSS 22MF (5X11) TP	
C606	CEXF1H100V	C ELECTRO	50V RSS 10MF (5X11) TP	
C609	CEXF1H109V	C ELECTRO	50V RSS 1MF (5X11) TP	
C610	CEXF1H109V	C ELECTRO	50V RSS 1MF (5X11) TP	
C611	CEXF1H109V	C ELECTRO	50V RSS 1MF (5X11) TP	
C612	CEXF1H100V	C ELECTRO	50V RSS 10MF (5X11) TP	
C614	CMXM2A104J	C MYLAR	100V 0.1MF J (TP)	

LOC.	PART-CODE	PART-NAME	PART-TYPE	REMARK
C615	CEXF1H100V	C ELECTRO	50V RSS 10MF (5X11) TP	
C616	CEXF1H339V	C ELECTRO	50V RSS 3.3MF (5X11) TP	
C617	CMXM2A104J	C MYLAR	100V 0.1MF J (TP)	
C618	CEXF1H109V	C ELECTRO	50V RSS 1MF (5X11) TP	
C619	CEXF1H109V	C ELECTRO	50V RSS 1MF (5X11) TP	
C620	CEXF1H109V	C ELECTRO	50V RSS 1MF (5X11) TP	
C621	CEXF1H109V	C ELECTRO	50V RSS 1MF (5X11) TP	
C622	CMXM2A104J	C MYLAR	100V 0.1MF J (TP)	
C623	CEXF1H100V	C ELECTRO	50V RSS 10MF (5X11) TP	
C625	CEXF1E470V	C ELECTRO	25V RSS 47MF (5X11) TP	
C626	CEXF1H479V	C ELECTRO	50V RSS 4.7MF (5X11) TP	
C627	CEXF1H100V	C ELECTRO	50V RSS 10MF (5X11) TP	
C628	CEXF1E470V	C ELECTRO	25V RSS 47MF (5X11) TP	
C629	CEXF1H479V	C ELECTRO	50V RSS 4.7MF (5X11) TP	
C630	CEXF1H100V	C ELECTRO	50V RSS 10MF (5X11) TP	
C631	CEXF1H339V	C ELECTRO	50V RSS 3.3MF (5X11) TP	
C632	CEXF1E470V	C ELECTRO	25V RSS 47MF (5X11) TP	
C701	CEXF1E470V	C ELECTRO	25V RSS 47MF (5X11) TP	
C702	CEXF1H470V	C ELECTRO	50V RSS 47MF (6.3X11) TP	
C703	CMXM2A104J	C MYLAR	100V 0.1MF J (TP)	
C704	CMXM2A104J	C MYLAR	100V 0.1MF J (TP)	
C705	CEXF1H470V	C ELECTRO	50V RSS 47MF (6.3X11) TP	
C706	CEXF1E470V	C ELECTRO	25V RSS 47MF (5X11) TP	
C707	CEXF1H100V	C ELECTRO	50V RSS 10MF (5X11) TP	
C708	CEXF1H109V	C ELECTRO	50V RSS 1MF (5X11) TP	
C709	CEXF1E470V	C ELECTRO	25V RSS 47MF (5X11) TP	
C710	CEXF1E470V	C ELECTRO	25V RSS 47MF (5X11) TP	
C711	CMXM2A333J	C MYLAR	100V 0.033MF J (TP)	
C712	CMXB1H224J	C MYLAR	50V EU 0.22MF J (TP)	
C713	CXCH1H309C	C CERA	50V CH 3PF C	
C803	CCXF3A472Z	C CERA	1KV F 4700PF Z (T)	⚠
C804	CCXF3A472Z	C CERA	1KV F 4700PF Z (T)	⚠
C807	CCXB3A102K	C CERA	1KV B 1000PF K (TAPPING)	
C808	CEXF2A100V	C ELECTRO	100V RSS 10MF (6.3X11) TP	
C809	CEXF1E101V	C ELECTRO	25V RSS 100MF (6.3X11) TP	
C820	CEXF1H100V	C ELECTRO	50V RSS 10MF (5X11) TP	
C821	CEXF1E101V	C ELECTRO	25V RSS 100MF (6.3X11) TP	
C822	CEXF1E470V	C ELECTRO	25V RSS 47MF (5X11) TP	
C823	CEXF1E101V	C ELECTRO	25V RSS 100MF (6.3X11) TP	
C825	CEXF1H100V	C ELECTRO	50V RSS 10MF (5X11) TP	
C826	CEXF1H479V	C ELECTRO	50V RSS 4.7MF (5X11) TP	
C829	CCXF3A472Z	C CERA	1KV F 4700PF Z (T)	
C830	CCXF3A472Z	C CERA	1KV F 4700PF Z (T)	
C831	CEXF1E101V	C ELECTRO	25V RSS 100MF (6.3X11) TP	
C904	CMXL2E104K	C MYLAR	250V MEU 0.1MF K	

LOC.	PART-CODE	PART-NAME	PART-TYPE	REMARK
C905	CMXL2E104K	C MYLAR	250V MEU 0.1MF K	
C906	CMXL2E104K	C MYLAR	250V MEU 0.1MF K	
C907	CCXB1H561K	C CERA	50V B 560PF K (TAPPING)	
C908	CCXB1H561K	C CERA	50V B 560PF K (TAPPING)	
C909	CCXB1H561K	C CERA	50V B 560PF K (TAPPING)	
C910	CEXF1E470V	C ELECTRO	25V RSS 47MF (5X11) TP	
F801A	4857415001	CLIP FUSE	PFC5000-0702	⚠
F801B	4857415001	CLIP FUSE	PFC5000-0702	⚠
I605	1K1A7042P-	IC SWITCH	KIA7042P	
QV01	TKTC3198Y-	TR	KTC3198Y	
QV02	TKTA1266Y-	TR	KTA1266Y (TP)	
Q301	TKTC3198Y-	TR	KTC3198Y	
Q401	T2SD1207T-	TR	2SD1207-T (TAPPING)	⚠
Q501	TKTC3198Y-	TR	KTC3198Y	
Q502	TKTC3198Y-	TR	KTC3198Y	
Q601	TKTC3198Y-	TR	KTC3198Y	
Q602	TKTC3198Y-	TR	KTC3198Y	
Q603	TKTC3198Y-	TR	KTC3198Y	
Q604	TKTC3197—	TR	KTC3197 (TP)	
Q605	TKTC3198Y-	TR	KTC3198Y	
Q701	TKTC3202Y-	TR	KTC3202Y (TP)	
Q702	TKTC3198Y-	TR	KTC3198Y	
Q703	TKTC3198Y-	TR	KTC3198Y	
Q704	TKTC3198Y-	TR	KTC3198Y	
Q705	TKTC3198Y-	TR	KTC3198Y	
Q706	TKTC3198Y-	TR	KTC3198Y	
Q707	TKTA1266Y-	TR	KTA1266Y (TP)	
Q708	TKTA1266Y-	TR	KTA1266Y (TP)	
Q709	TKTA1266Y-	TR	KTA1266Y (TP)	
Q710	TKTC3198Y-	TR	KTC3198Y	
Q801	TKTC3197—	TR	KTC3197 (TP)	
Q901	TKTA1266Y-	TR	KTA1266Y (TP)	
SW01	5S50101090	SW TACT	SKHV17910A	
SW02	5S50101090	SW TACT	SKHV17910A	
SW03	5S50101090	SW TACT	SKHV17910A	
SW04	5S50101090	SW TACT	SKHV17910A	
SW05	5S50101090	SW TACT	SKHV17910A	
ZMP10	PSMPJA0113	PCB MAIN AXIAL AS	DTT-21T2LF	
A001	4859801993	PCB MAIN	330X246 S1B	
DV01	DMTZ6R2B—	DIODE ZENER	MTZ 6.2-B (TAPPING)	
DV02	DMTZ6R2B—	DIODE ZENER	MTZ 6.2-B (TAPPING)	
DV03	DMTZ6R2B—	DIODE ZENER	MTZ 6.2-B (TAPPING)	
DV04	DMTZ6R2B—	DIODE ZENER	MTZ 6.2-B (TAPPING)	
DV05	DMTZ6R2B—	DIODE ZENER	MTZ 6.2-B (TAPPING)	
DV06	DMTZ6R2B—	DIODE ZENER	MTZ 6.2-B (TAPPING)	

LOC.	PART-CODE	PART-NAME	PART-TYPE	REMARK
DV07	DMTZ6R2B—	DIODE ZENER	MTZ 6.2-B (TAPPING)	
DV08	DMTZ6R2B—	DIODE ZENER	MTZ 6.2-B (TAPPING)	
DV09	DMTZ6R2B—	DIODE ZENER	MTZ 6.2-B (TAPPING)	
DV11	DMTZ6R2B—	DIODE ZENER	MTZ 6.2-B (TAPPING)	
DV12	DMTZ6R2B—	DIODE ZENER	MTZ 6.2-B (TAPPING)	
DV13	DMTZ6R2B—	DIODE ZENER	MTZ 6.2-B (TAPPING)	
DV14	DMTZ6R2B—	DIODE ZENER	MTZ 6.2-B (TAPPING)	
DV15	DMTZ6R2B—	DIODE ZENER	MTZ 6.2-B (TAPPING)	
DV16	DMTZ6R2B—	DIODE ZENER	MTZ 6.2-B (TAPPING)	
DV17	DMTZ6R2B—	DIODE ZENER	MTZ 6.2-B (TAPPING)	
DV19	D1N4148—	DIODE	1N4148 (TAPPING)	
D101	D1N4148—	DIODE	1N4148 (TAPPING)	
D301	DUZ5R1BM—	DIODE ZENER	UZ-5.1BM	
D401	DBYV95C—	DIODE	BYV95C (TAPPING)	⚠
D402	DBYV95C—	DIODE	BYV95C (TAPPING)	⚠
D403	DBYV95C—	DIODE	BYV95C (TAPPING)	⚠
D404	DBYV95C—	DIODE	BYV95C (TAPPING)	⚠
D405	DUZ5R1BM—	DIODE ZENER	UZ-5.1BM	
D406	D1N4148—	DIODE	1N4148 (TAPPING)	
D407	D1N4148—	DIODE	1N4148 (TAPPING)	
D501	DMTZ5R1B—	DIODE ZENER	MTZ 5.1-B (TAPPING)	
D503	D1N4148—	DIODE	1N4148 (TAPPING)	
D504	D1N4148—	DIODE	1N4148 (TAPPING)	
D603	D1N4148—	DIODE	1N4148 (TAPPING)	
D701	D1N4148—	DIODE	1N4148 (TAPPING)	
D702	D1N4148—	DIODE	1N4148 (TAPPING)	
D703	D1N4148—	DIODE	1N4148 (TAPPING)	
D704	D1N4148—	DIODE	1N4148 (TAPPING)	
D705	DMTZ6R2B—	DIODE ZENER	MTZ 6.2-B (TAPPING)	
D706	DMTZ6R2B—	DIODE ZENER	MTZ 6.2-B (TAPPING)	
D711	DMTZ6R2B—	DIODE ZENER	MTZ 6.2-B (TAPPING)	
D712	DMTZ6R2B—	DIODE ZENER	MTZ 6.2-B (TAPPING)	
D801	D1S1888—	DIODE	1S1888 (TAPPING)	⚠
D802	D1S1888—	DIODE	1S1888 (TAPPING)	⚠
D803	D1S1888—	DIODE	1S1888 (TAPPING)	⚠
D804	D1S1888—	DIODE	1S1888 (TAPPING)	⚠
D805	DBYV95C—	DIODE	BYV95C (TAPPING)	⚠
D806	DBYV95C—	DIODE	BYV95C (TAPPING)	⚠
D807	DBYV95C—	DIODE	BYV95C (TAPPING)	⚠
D808	DBYV95C—	DIODE	BYV95C (TAPPING)	⚠
D811	DBYV95C—	DIODE	BYV95C (TAPPING)	⚠
D812	DBYV95C—	DIODE	BYV95C (TAPPING)	⚠
D814	D1N4148—	DIODE	1N4148 (TAPPING)	
D816	D1N4148—	DIODE	1N4148 (TAPPING)	
D817	DBYV95C—	DIODE	BYV95C (TAPPING)	

LOC.	PART-CODE	PART-NAME	PART-TYPE	REMARK
D820	DBYV95C—	DIODE	BYV95C (TAPPING)	
D901	D1N4148—	DIODE	1N4148 (TAPPING)	
D902	D1N4148—	DIODE	1N4148 (TAPPING)	
D903	D1N4148—	DIODE	1N4148 (TAPPING)	
D904	D1N4148—	DIODE	1N4148 (TAPPING)	
D905	DMTZ6R2B—	DIODE ZENER	MTZ 6.2-B (TAPPING)	
J001	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J002	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J004	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J005	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J006	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J007	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J008	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J009	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J010	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J011	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J012	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J013	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J014	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J015	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J016	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J017	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J018	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J019	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J020	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J021	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J022	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J023	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J024	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J025	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J026	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J027	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J028	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J029	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J030	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J031	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J032	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J033	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J034	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J035	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J036	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J037	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J038	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	

LOC.	PART-CODE	PART-NAME	PART-TYPE	REMARK
J039	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J040	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J041	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J042	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J043	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J044	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J045	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J046	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J047	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J048	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J049	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J050	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J052	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J057	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J058	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J059	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J060	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J061	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J062	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J063	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J064	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J065	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J066	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J067	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J068	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J069	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J070	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J071	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J072	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J073	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J074	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J075	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J076	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J077	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J078	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J079	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J080	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J081	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J082	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J083	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J084	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J085	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J086	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J087	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J088	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	

LOC.	PART-CODE	PART-NAME	PART-TYPE	REMARK
J089	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J091	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J092	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J093	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J094	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J096	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J097	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J098	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J099	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J100	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J101	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J102	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J103	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J104	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J105	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J107	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J108	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J109	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J110	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J111	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J112	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J113	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J114	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J115	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J116	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J117	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J118	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J119	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J120	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J121	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J122	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J123	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J124	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J125	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J126	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J127	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J128	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J129	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J130	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J131	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J132	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J133	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J134	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J135	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J136	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	

LOC.	PART-CODE	PART-NAME	PART-TYPE	REMARK
J137	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J139	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J140	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J141	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J142	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J143	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J144	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J145	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J146	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J147	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J148	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J153	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J154	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J155	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J156	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J157	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J158	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J159	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J161	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J162	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J163	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J164	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J165	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J166	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J167	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J168	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J169	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J170	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J171	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J172	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J173	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J174	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J175	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J176	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J177	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J178	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J179	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J181	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J182	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J183	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
LV01	5CPZ100K04	COIL PEAKING	10UH 10.5MM K (LAL04TB)	
LV02	5CPZ100K04	COIL PEAKING	10UH 10.5MM K (LAL04TB)	
LV03	5CPZ100K04	COIL PEAKING	10UH 10.5MM K (LAL04TB)	
LV04	5CPZ100K04	COIL PEAKING	10UH 10.5MM K (LAL04TB)	
LV05	5CPZ109M04	COIL PEAKING	1UH 10.5MM M (LAL04TB)	

LOC.	PART-CODE	PART-NAME	PART-TYPE	REMARK
LV06	5CPZ100K04	COIL PEAKING	10UH 10.5MM K (LAL04TB)	
LV07	5CPZ100K04	COIL PEAKING	10UH 10.5MM K (LAL04TB)	
LV09	5CPZ109M04	COIL PEAKING	1UH 10.5MM M (LAL04TB)	
LV10	5CPZ100K04	COIL PEAKING	10UH 10.5MM K (LAL04TB)	
LV11	5CPZ100K04	COIL PEAKING	10UH 10.5MM K (LAL04TB)	
L101	5CPZ470K02	COIL PEAKING	47UH K (AXIAL 3.5MM)	
L301	5CPZ100K04	COIL PEAKING	10UH 10.5MM K (LAL04TB)	
L302	5CPZ100K04	COIL PEAKING	10UH 10.5MM K (LAL04TB)	
L401	5CPZ109M04	COIL PEAKING	1UH 10.5MM M (LAL04TB)	
L601	5CPZ479K02	COIL PEAKING	4.7UH K (AXIAL 3.5MM)	
L602	5CPZ479K02	COIL PEAKING	4.7UH K (AXIAL 3.5MM)	
L603	5CPZ479K02	COIL PEAKING	4.7UH K (AXIAL 3.5MM)	
L604	5CPZ479K02	COIL PEAKING	4.7UH K (AXIAL 3.5MM)	
L605	5CPZ479K02	COIL PEAKING	4.7UH K (AXIAL 3.5MM)	
L608	5CPZ100K04	COIL PEAKING	10UH 10.5MM K (LAL04TB)	
L609	5CPZ100K04	COIL PEAKING	10UH 10.5MM K (LAL04TB)	
L610	5CPZ100K04	COIL PEAKING	10UH 10.5MM K (LAL04TB)	
L701	5CPZ689K02	COIL PEAKING	6.8UH K (AXIAL 3.5MM)	
L802	5MC0000100	COIL BEAD	MD-5 (HC-3550)	
L806	5MC0000100	COIL BEAD	MD-5 (HC-3550)	
RV06	RD-4Z750J-	R CARBON FILM	1/4 75 OHM J	
RV07	RD-AZ102J-	R CARBON FILM	1/6 1K OHM J	
RV08	RD-AZ750J-	R CARBON FILM	1/6 75 OHM J	
RV09	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
RV10	RD-AZ750J-	R CARBON FILM	1/6 75 OHM J	
RV11	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
RV12	RD-AZ750J-	R CARBON FILM	1/6 75 OHM J	
RV13	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
RV14	RD-AZ102J-	R CARBON FILM	1/6 1K OHM J	
RV15	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
RV16	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
RV17	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R101	RD-AZ122J-	R CARBON FILM	1/6 1.2K OHM J	
R301	RD-2Z153J-	R CARBON FILM	1/2 15K OHM J	
R302	RD-AZ272J-	R CARBON FILM	1/6 2.7K OHM J	
R303	RD-4Z229J-	R CARBON FILM	1/4 2.2 OHM J	
R304	RD-4Z229J-	R CARBONFILM	1/4 2.2 OHM J	
R305	RD-2Z271J-	R CARBON FILM	1/2 270 OHM J	
R306	RD-AZ472J-	R CARBON FILM	1/6 4.7K OHM J	
R307	RD-4Z822J-	R CARBON FILM	1/4 8.2K OHM J	
R308	RD-4Z223J-	R CARBON FILM	1/4 22K OHM J	
R401	RD-4Z272J-	R CARBON FILM	1/4 2.7K OHM J	
R402	RD-4Z399J-	R CARBON FILM	1/4 3.9 OHM J	
R404	RD-4Z153J-	R CARBON FILM	1/4 15K OHM J	
R409	RD-4Z102J-	R CARBON FILM	1/4 1K OHM J	

LOC.	PART-CODE	PART-NAME	PART-TYPE	REMARK
R410	RD-2Z273J-	R CARBON FILM	1/2 27K OHM J	
R413	RD-AZ303J-	R CARBON FILM	1/6 30K OHM J	
R414	RD-AZ303J-	R CARBON FILM	1/6 30K OHM J	
R501	RD-4Z109J-	R CARBON FILM	1/4 1 OHM J	
R502	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R503	RD-AZ682J-	R CARBON FILM	1/6 6.8K OHM J	
R504	RD-AZ303J-	R CARBON FILM	1/6 30K OHM J	
R505	RD-AZ472J-	R CARBON FILM	1/6 4.7K OHM J	
R507	RD-AZ102J-	R CARBON FILM	1/6 1K OHM J	
R508	RD-AZ102J-	R CARBON FILM	1/6 1K OHM J	
R601	RD-2Z151J-	R CARBON FILM	1/2 150 OHM J	
R602	RD-2Z151J-	R CARBON FILM	1/2 150 OHM J	
R603	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R604	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R605	RD-AZ202J-	R CARBON FILM	1/6 2K OHM J	
R606	RD-AZ103J-	R CARBON FILM	1/6 10K OHM J	
R608	RD-AZ102J-	R CARBON FILM	1/6 1K OHM J	
R701	RD-4Z101J-	R CARBON FILM	1/4 100 OHM J	
R702	RD-4Z109J-	R CARBON FILM	1/4 1 OHM J	
R705	RD-4Z333J-	R CARBONFILM	1/4 33K OHM J	
R706	RD-4Z100J-	R CARBON FILM	1/4 10 OHM J	
R708	RD-AZ122J-	R CARBON FILM	1/6 1.2K OHM J	
R709	RD-AZ122J-	R CARBON FILM	1/6 1.2K OHM J	
R710	RD-AZ122J-	R CARBON FILM	1/6 1.2K OHM J	
R711	RD-AZ333J-	R CARBON FILM	1/6 33K OHM J	
R712	RD-AZ103J-	R CARBON FILM	1/6 10K OHM J	
R713	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R714	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R716	RD-AZ102J-	R CARBON FILM	1/6 1K OHM J	
R717	RD-AZ472J-	R CARBON FILM	1/6 4.7K OHM J	
R718	RD-AZ472J-	R CARBON FILM	1/6 4.7K OHM J	
R719	RD-AZ103J-	R CARBON FILM	1/6 10K OHM J	
R720	RD-AZ391J-	R CARBON FILM	1/6 390 OHM J	
R721	RD-AZ103J-	R CARBON FILM	1/6 10K OHM J	
R806	RD-4Z102J-	R CARBON FILM	1/4 1K OHM J	
R807	RD-4Z222J-	R CARBON FILM	1/4 2.2K OHM J	
R808	RD-4Z220J-	R CARBON FILM	1/4 22 OHM J	
R809	RD-4Z104J-	R CARBON FILM	1/4 100K OHM J	
R825	RC-2Z565J-	R CARBON COMP	1/2 5.6M OHM J	
R826	RD-4Z101J-	R CARBON FILM	1/4 100 OHM J	
R827	RD-4Z332J-	R CARBON FILM	1/4 3.3K OHM J	
R828	RD-AZ103J-	R CARBON FILM	1/6 10K OHM J	
R831	RD-AZ473J-	R CARBON FILM	1/6 47K OHM J	
R832	RD-4Z470J-	R CARBON FILM	1/4 47 OHM J	
R901	RD-AZ202J-	R CARBON FILM	1/6 2K OHM J	

LOC.	PART-CODE	PART-NAME	PART-TYPE	REMARK
R902	RD-AZ202J-	R CARBON FILM	1/6 2K OHM J	
R903	RD-AZ202J-	R CARBON FILM	1/6 2K OHM J	
R904	RD-AZ162J-	R CARBON FILM	1/6 1.6K OHM J	
R905	RD-AZ162J-	R CARBON FILM	1/6 1.6K OHM J	
R906	RD-AZ162J-	R CARBON FILM	1/6 1.6K OHM J	
R907	RD-4Z104J-	R CARBON FILM	1/4 100K OHM J	
R908	RD-4Z104J-	R CARBON FILM	1/4 100K OHM J	
R909	RD-4Z104J-	R CARBON FILM	1/4 100K OHM J	
R910	RC-2Z152J-	R CARBON COMP	1/2 1.5K OHM J	
R911	RC-2Z152J-	R CARBONCOMP	1/2 1.5K OHM J	
R912	RC-2Z152J-	R CARBON COMP	1/2 1.5K OHM J	
R913	RD-AZ223J-	R CARBON FILM	1/6 22K OHM J	
Z101	5PMKT40MA-	FILTER CERA	MKT40MA100P	
ZSP10	PSSPPW0034	SPEAKER AS	DTT21T2TF	
SP01	4858305220	SPEAKER	3W 8 OHM MSF-2D30SB02U	
SP01A	4850704S13	CONN AS	YH025-04+YST025+USW=600	
SP02	4858305220	SPEAKER	3W 8 OHM MSF-2D30SB02U	
ZCG10	48519A5210	CRT GROUND AS	2101H-1015-1P	
ZDC10	58G0000074	COIL DEGAUSSING	DC-2070	⚠
ZPK10	PSPKCP0034	PACKING AS	DTT-21T2TF	
M641	6520010100	STAPLE PIN	18M/M J D O	
M801	4858047600	BOX CARTON	DW-2 659X520X509	
M811	4858179500	PAD	EPS 21T2	
M821	4858261300	BAG P.E	L.D.P.E T0.02X1300X1000	
ZTR10	48B3228B03	TRANSMITTER REMOCON	R-28B03	

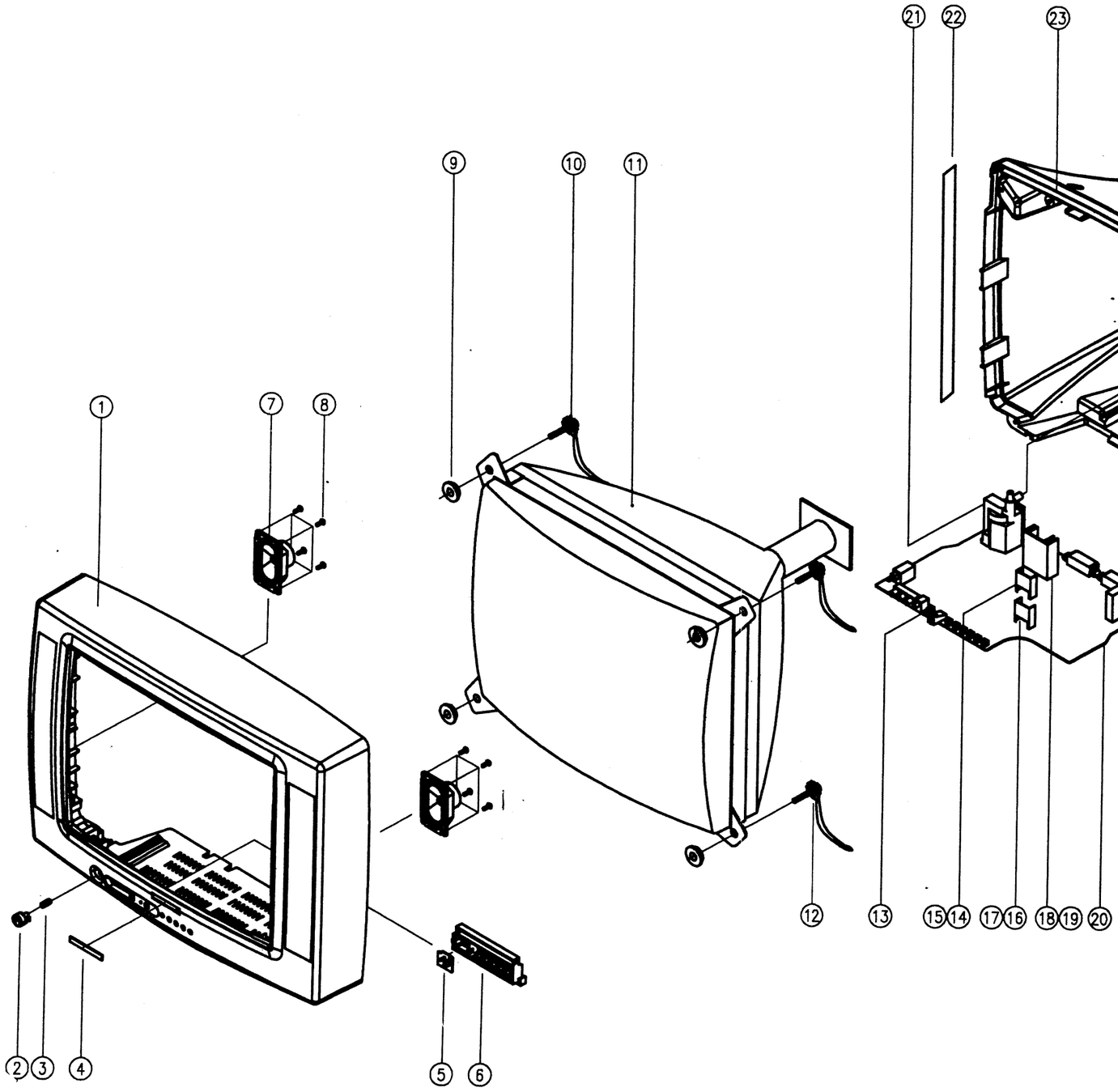
■ The Different Parts for CRT(CP-380L)

NO	LOC.	NAME	20'(ORION)	21"(ORION)	21"(PHILIPS)	21"(POLKOLOR)
1	V901	CRT	A48JLL90X01 48A96420P1	A51JSW90X02 48A96321P1	A51EAL55X01 4859607660	A51EBV13X09 485962160
2	C401	C CERA	2KV 470PF CCXB3D471K	2KV 220PF CCXB3D221K	2KV 470PF CCXB3D471K	2KV 220PF CCXB3D221K
3	C402	C MYLAR	1.6KV 7500PF CMYH3C752J	1.6KV 6300PF CMYH3C622J	1.6KV 7500PF CMYH3C752J	1.6KV 6900PF CMYH3C692J
4	C404	C MYLAR	200V 0.47MF CMYB2D474K	200V 0.3MF CMYE2D304J	200V 0.51MF CMYE2D514J	200V 0.27MF CMYE2D274J
5	L404	COIL H-LINEARITY	L-102 58H0000016	←	←	TRL-341G 58H000004O
6	L806	COIL BEAD	X	MD-5 5MC0000100	X	X
7	L807	COIL BEAD	MD-5 5MC0000100	X	MD-5 5MC0000100	X
8	P401A	CONN AS	X	X	35135-06+HS 30052+ULW=500 4850706S10	←
9	R302	R C-FILM	1/6W 2.2K RD-AZ222J-	1/6W 2.7K RD-AZ272J-	1/6W 3.3K RD-AZ332J-	1/6W 2.7K RD-AZ272J-
10	R406	R FUSIBLE	1W 2.4A(F) RF01Y249JA	1W 1A(F) RF01Y109JA	1W 2.7A(F) RF01Y279JA	1W 1.2A(F) RF1Y129JA
11	R827	R C-FILM	1/4W 4.3K RD-4Z432J-	1.4W 3.3K RD-4Z332J-	1/4W 4.3K RD-4Z432J-	←
12	SCT1	SOCKET CRT	ISMM03S 4859303030	←	X	X
13	SCT2	SOCKET CRT	X	X	ISHS-09S 4859302930	←
14	ZCG10	CRT GND AS	2001H-1015P-IP 48519A5010	2101H-1015-1P 48519A5210	←	←
15	ZDC10	COIL DEGAUSSING	DC-2050 58G0000086	DC-2070 58G0000074	←	←

■ The Different Parts for System(CP-380L)

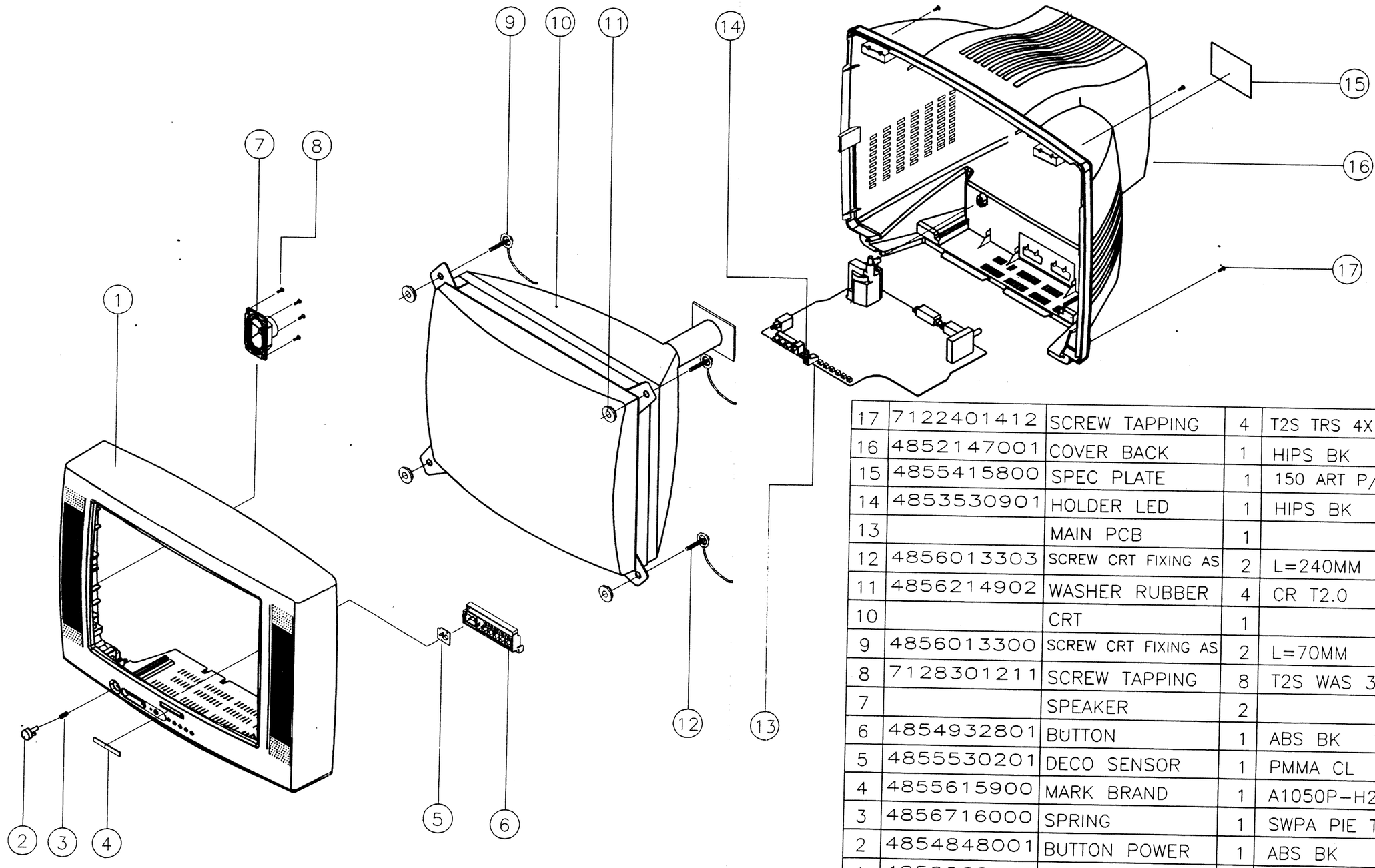
NO	LOC.	NAME	LF	LK	LU	LA
1	J051	WIRE COPPER	X	←	AWG22 1/0.65 TIN COATING	X
					85801065GY	
2	J052	WIRE COPPER	AWG22 1/0.65 TIN COATING	X	←	←
			85801065GY			
3	J054	WIRE COPPER	X	AWG22 1/0.65 TIN COATING	X	←
				85801065GY		
4	J055	WIRE COPPER	X	←	←	AWG22 1/0.65 TIN COATING
						85801065GY
5	J805	C ELECTRO	400V 120MF	450V 150MF	400V 120MF	←
			CEYM2G121T	CEYN2W151P	CEYM2G121T	
6	D601	DIODE	X	←	←	1S2186
						D1S2186—
7	D602	DIODE	X	←	←	1S2186
						D1S2186—
8	I501	IC VCD	TDA8374A	←	←	TDA8374
			1TDA8374A--			1TDA8374—
9	I502	IC	X	TDA8395	X	TDA8395
			X	1TDA8395--		1TDA8395--
10	I603	IC	X	←	←	TDA4445B
						1TDA4445B–
11	PWC1	CORD POWER AS	CW4232+BL102NG +TUBE=2500	KKP419C+BL102NG +TUBE+2100	CW3222/240V 5A +HOUS=2200	CW4232+BL102NG +TUBE=2500
			4859903110	4859902910	4859905110	4859903110
12	SF01	FILTER SAW	G3962M	K3953M	←	G3962M
			5PG3962M--	5PK3953M--		5PG3962M--
13	SF02	FILTER SAW	X	←	←	L9461M
						5PL9461M--
14	SF03	FILTER SAW	G9251M	K9260M	←	G925M
			5PG9251M--	5PK9260M--		5PG9251M--
15	TU01	TUNER VARACTOR	3303KHC	←	DT2-IV17D	3303KHC
			4859714430		4859716130	4859714430
16	Z101	FILTER CERA	MKT40MA100P 5PMKT40MA--	X	MKT40MA100P 5PMKT40MA--	←

■ MECHANICAL EXPLODED VIEW
■ 21T2



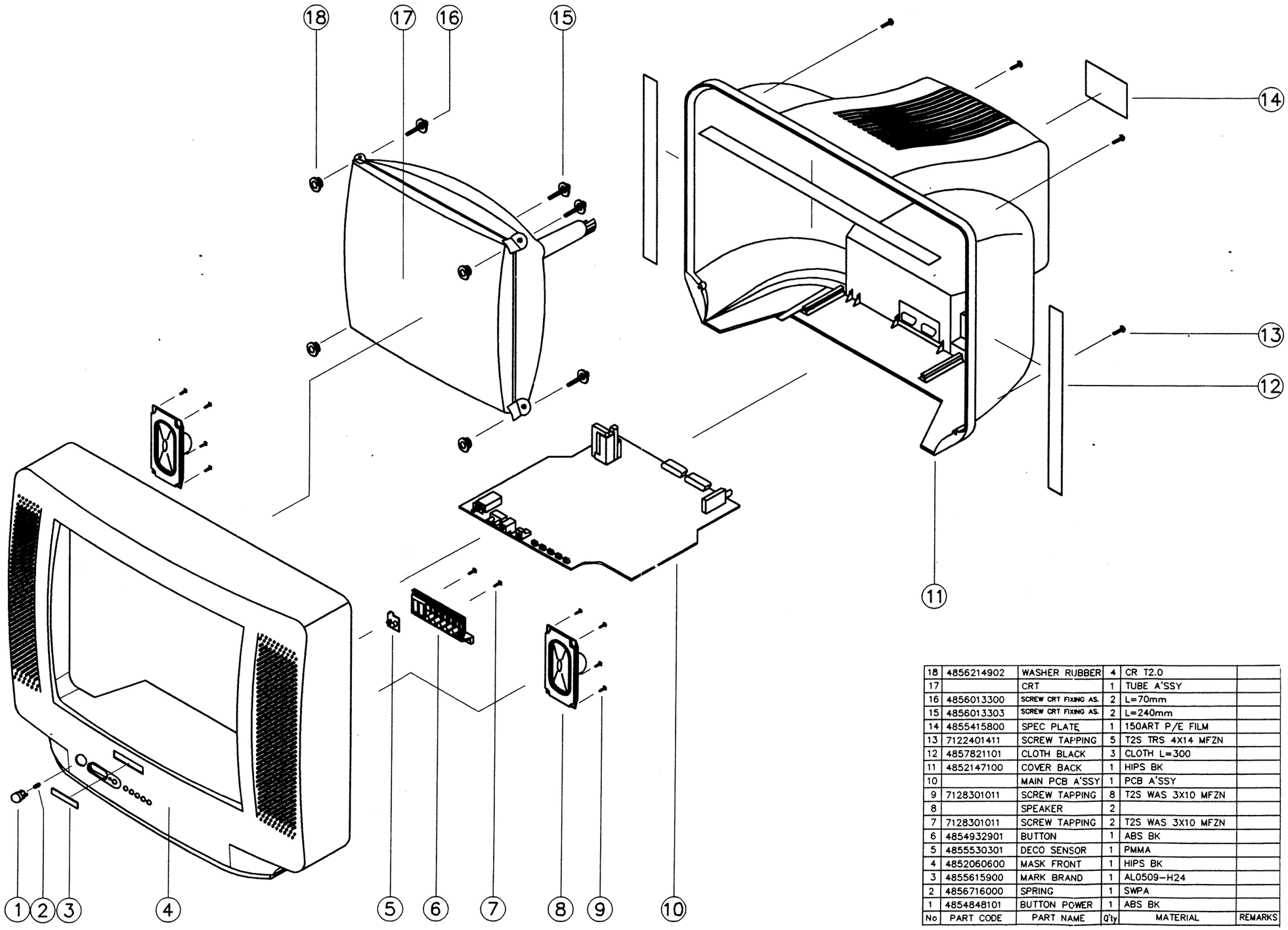
No	PART CODE	PART NAME	Q'ty	MATERIAL	REMARKS
25	4855415800	SPEC PLATE	1	150ART P/E FILM(C/TV)	
24	7122401612	SCREW TAPPING	5	T2S TRS 4X16 MFZN BK	
23	4852147501	COVER BACK	1	HIPS BK	
22	4857817610	CLOTH BLACK	3	FELT T0.7 L=300	
21		F. B. T			
20		PCB			CP-380
19	7174301011	SCREW TAPPITITE	2	TT2 RND 3X10 MFZN	
18	4857024617	HEAT SINK	1	AL EX	
17	7174300811	SCREW TAPPITITE	1	TT2 RND 3X8 MFZN	
16	4857025401	HEAT SINK	1	A1050P-H24 T2	
15	7174300811	SCREW TAPPITITE	1	TT2 RND 3X8 MFZN	
14	4857025401	HEAT SINK	1	A1050P-H24 T2	
13	4853530901	HOLDER LED	1	FR HIPS BK	
12	4856013302	SCREW CRT FIXING AS	2	L=190MM	
11		CRT	1		
10	4856013300	SCREW CRT FIXING AS	2	L=70MM	
9	4856214901	WASHER RUBBER	4	CR T1.0	
8	7128301211	SCREW TAPPING	8	T2S WAS 3X12 MFZN	
7	4858308220	SPEAKER	2		
6	4854830701	BUTTON	1	ABS BK	
5	4855830701	DECO SENSOR	1	PMMA C.L	
4	4855815900	MARK BRAND	1	A1050P-H24 T0.4	
3	4856716000	SPRING	1	SWPA PIED.5	
2	4854848401	BUTTON POWER	1	ABS BK	
1	4852060901	MASK FRONT	1	HIPS BK	

21T1



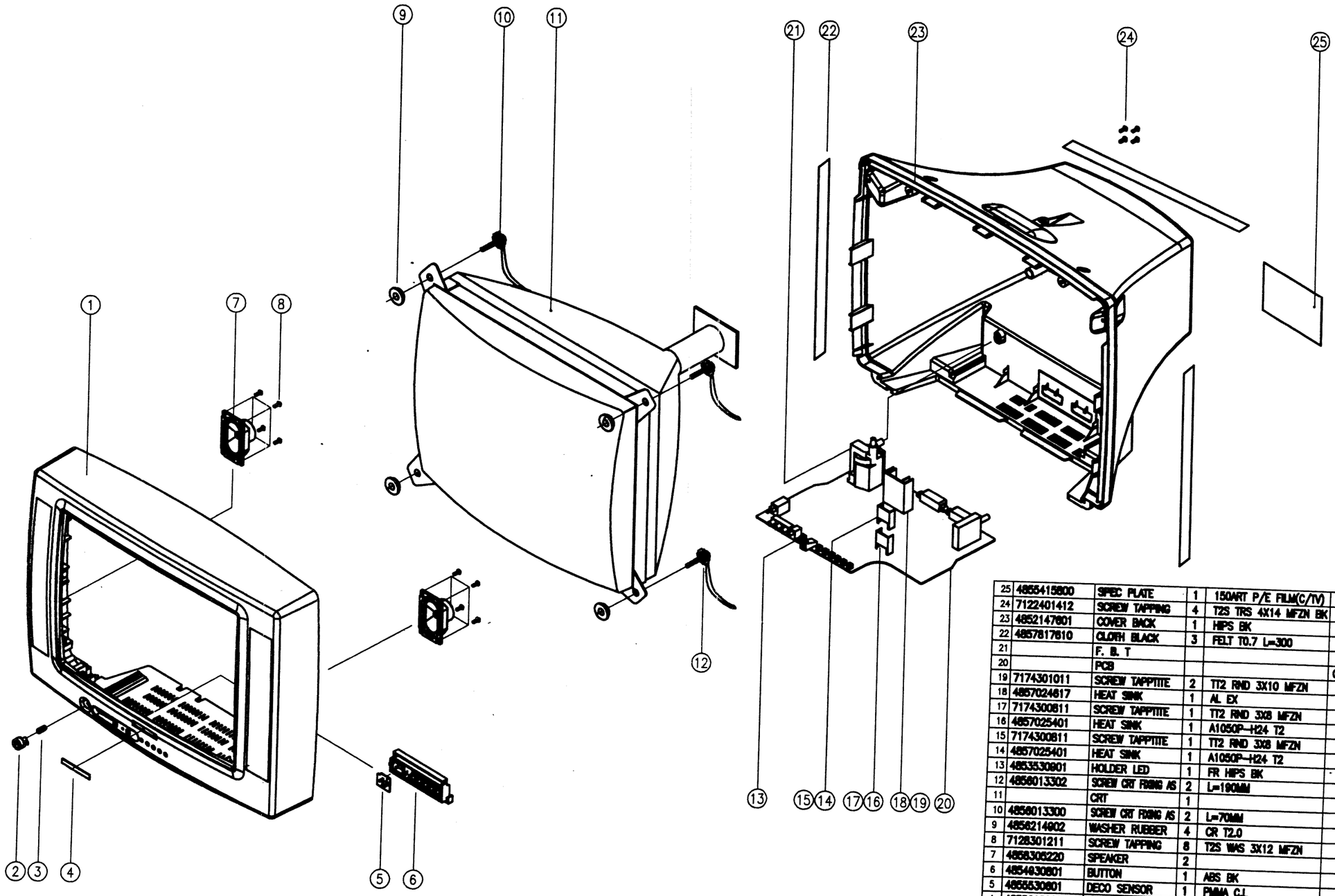
No	PART CODE	PART NAME	Q'ty	MATERIAL
17	7122401412	SCREW TAPPING	4	T2S TRS 4X14 MFZN BK
16	4852147001	COVER BACK	1	HIPS BK
15	4855415800	SPEC PLATE	1	150 ART P/E FILM(C/TV)
14	4853530901	HOLDER LED	1	HIPS BK
13		MAIN PCB	1	
12	4856013303	SCREW CRT FIXING AS	2	L=240MM
11	4856214902	WASHER RUBBER	4	CR T2.0
10		CRT	1	
9	4856013300	SCREW CRT FIXING AS	2	L=70MM
8	7128301211	SCREW TAPPING	8	T2S WAS 3X12 MFZN
7		SPEAKER	2	
6	4854932801	BUTTON	1	ABS BK
5	4855530201	DECO SENSOR	1	PMMA CL
4	4855615900	MARK BRAND	1	A1050P-H24 T0.4
3	4856716000	SPRING	1	SWPA PIE T0.5
2	4854848001	BUTTON POWER	1	ABS BK
1	4852060401	MASK FRONT	1	HIPS BK

■ 20T1



No	PART CODE	PART NAME	Q'ty	MATERIAL	REMARKS
18	4856214902	WASHER RUBBER	4	CR T2.0	
17		CRT	1	TUBE A'SSY	
16	4856013300	SCREW CRT FIXING AS.	2	L=70mm	
15	4856013303	SCREW CRT FIXING AS.	2	L=240mm	
14	4855415800	SPEC PLATE	1	150ART P/E FILM	
13	7122401411	SCREW TAPPING	5	T2S TRS 4X14 MFZN	
12	4857821101	CLOTH BLACK	3	CLOTH L=300	
11	4852147100	COVER BACK	1	HIPS BK	
10		MAIN PCB A'SSY	1	PCB A'SSY	
9	7128301011	SCREW TAPPING	8	T2S WAS 3X10 MFZN	
8		SPEAKER	2		
7	7128301011	SCREW TAPPING	2	T2S WAS 3X10 MFZN	
6	4854932901	BUTTON	1	ABS BK	
5	4855530301	DECO SENSOR	1	PMMA	
4	4852060600	MASK FRONT	1	HIPS BK	
3	4855615900	MARK BRAND	1	AL0509-H24	
2	4856716000	SPRING	1	SWPA	
1	4854848101	BUTTON POWER	1	ABS BK	

■ 20T2



No	PART CORD	PART NAME	Q'ty	MATERIAL	REMARKS
25	4855415800	SPEC PLATE	1	150ART P/E FILM(C/TV)	
24	7122401412	SCREW TAPPING	4	T2S TRS 4X14 MFZN BK	
23	4852147801	COVER BACK	1	HIPS BK	
22	4857817610	CLOTH BLACK	3	FELT T0.7 L=300	
21		F. B. T			
20		PCB			CP-360
19	7174301011	SCREW TAPPITITE	2	TT2 RND 3X10 MFZN	
18	4857024617	HEAT SINK	1	AL EX	
17	7174300811	SCREW TAPPITITE	1	TT2 RND 3X8 MFZN	
16	4857025401	HEAT SINK	1	A1050P-H24 T2	
15	7174300811	SCREW TAPPITITE	1	TT2 RND 3X8 MFZN	
14	4857025401	HEAT SINK	1	A1050P-H24 T2	
13	4853530901	HOLDER LED	1	FR HIPS BK	
12	4856013302	SCREW CRT FIXING AS	2	L=190MM	
11		CRT	1		
10	4856013300	SCREW CRT FIXING AS	2	L=70MM	
9	4856214902	WASHER RUBBER	4	CR T2.0	
8	7128301211	SCREW TAPPING	8	T2S WAS 3X12 MFZN	
7	4858306220	SPEAKER	2		
6	4854630801	BUTTON	1	ABS BK	
5	4855530801	DECO SENSOR	1	PMMA C.L	
4	4855619900	MARK BRAND	1	A1050P-H24 T0.4	
3	4856716000	SPRING	1	SWPA PIE0.5	
2	4854848501	BUTTON POWER	1	ABS BK	
1	4852061001	MASK FRONT	1	HIPS BK	